

Volume 4

1971

Pages L1-132, 1-1842

**Journal of
Physics B**

Atomic and Molecular Physics



EUROPHYSICS JOURNAL

THE INSTITUTE OF PHYSICS

LONDON AND BRISTOL

Copyright © 1971 by the Institute of Physics and individual contributors. All rights reserved.

Under Part 1, Section 7 of the Copyright Act 1956 some libraries are permitted to make single copies of articles for individuals requiring them for the purpose of research or private study. The classes of library accorded this privilege and the conditions under which it is available are set out in the Act and in the associated Board of Trade regulations (Statutory Instruments, 1957, No. 868). Most libraries attached to higher educational establishments and research organizations, whether in the UK or elsewhere, qualify for this privilege provided that they were not established, and are not conducted, for profit. The Act, however, restricts the concession to material not exceeding one article in any one publication and requires that the individual making use of the service must pay at least the cost price of producing the copy.

Except for single copies covered by the concession relating to research and private study no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without permission of the copyright owners.

Published by The Institute of Physics, 47 Belgrave Square, London SW1, England, in association with the American Institute of Physics.

Journal of Physics B: Atomic and Molecular Physics is published as a monthly journal. Details are available on request.

Printed in Great Britain by J W Arrowsmith Ltd. Set in 11/12pt. Imprint.

Journal of Physics B: Atomic and Molecular Physics

Editorial board 1971

Professor M J Seaton PH D FRS *Honorary Editor and Chairman*

Professor P G Burke PH D

Professor A G Gaydon DSC FRS F INST P

M F A Harrison B SC

Dr P F A Klinkenberg

H G Kuhn MA D PHIL D SC FRS

Professor Dr W Lochte-Holtgreven

F Mandl D PHIL F INST P

A N Prasad PH D

Professor G. W Series MA D PHIL

Professor K F Smith MA PH D

Professor I. M. Mills D PHIL

Assistant editor

R Kershaw B SC

**BLANK
PAGE**

Contents

NO 1 JANUARY 1971

Letters to the editor

- L1 *H I Gunn and W J Sandle* · A method for the direct determination of the decay rate γ_0 for the population of an excited atomic state
- L5 *G Banerji, S N Banerjee and N C Sil* · Binding energy of helium atom by Faddeev formalism

Papers

- 1 *F P Larkins* · Charge state dependence of x-ray and Auger electron emission spectra for rare-gas atoms: I—The argon atom
- 14 *F P Larkins* · Charge state dependence of x-ray and Auger electron emission spectra for rare-gas atoms: II—The neon atom
- 20 *L Veseth* · Spin-rotation interaction in diatomic molecules
- 28 *L L Boyle and L Crawford Jones* · Determination of operator equivalents from irreducible tensors
- 32 *E Høloien and J Midtdal* · Tests of the multiconfiguration energy-bound method for Feshbach-type auto-ionization states of two-electron atoms: II—Application to He states between higher thresholds
- 42 *S A Lebedeff* · On a relation between unitary transformations in the impact parameter approximation which describes the behaviour of the electrons before and after the trajectory crosses the turning point
- 53 *D T Birtwistle and A Herzenberg* · Vibrational excitation of N_2 by resonance scattering of electrons
- 71 *W N Shelton, K L Baluja and C E Watson* · Elastic exchange scattering of electrons on the hydrogen atom in the distorted wave approximation
- 79 *C R Garibotti and P A Massaro* · Approximation methods in the scattering of fast electrons and positrons by hydrogen atoms
- 88 *B Peart, D S Walton and K T Dolder* · The formation of H^+ from H^- ions by electron impact
- 94 *H B Gilbody, R Browning, R M Reynolds and G I Riddell* · Collisional destruction of fast metastable hydrogen atoms
- 106 *F R Simpson, R Browning and H B Gilbody* · An experimental study of the decay of the He^- ion
- 111 *M Matić and B Čobić* · Electron loss by C^- and O^- ions in gaseous targets
- 116 *J R Gott* · Effect of molecular structure on optical second-harmonic generation from organic crystals
- 124 *J Czarny, P Felenbok and H Lefebvre-Brion* · High vibrational level predissociation in the $A^2\Sigma^+$ state of OD
- 133 *C Santaram, V K Vaidyan and J G Winans* · The visible emission spectra of $ZnTi_2$, $CdTi_2$, $ZnTi$, and $CdTi$ molecules

142 Book notice

Contents

NO 2 FEBRUARY 1971

Letters to the editor

- L7 D D Burgess · An explanation of the apparent non-observation of 'near' plasma satellite emission lines in highly turbulent plasmas

Papers

- 143 A Norcliffe · Correspondence identities V. The zero-energy Coulomb problem
153 P G Burke, A Hibbert and W D Robb · Electron scattering by complex atoms
162 K L Bell and A E Kingston · Electron loss from fast metastable hydrogen atoms passing through atomic hydrogen and helium
168 I Roeggen · The theory of the Stark effect in multiplet states of diatomic polar molecules
191 J C Y Chen and L Hambro · Multiple scattering expansions for nonrelativistic three-body collision problems II. Convergence of the Faddeev-Watson expansion for rearrangement collisions
208 S P Khare and P Shobha · Differential cross sections for the elastic scattering of electrons by helium atoms
215 R K Janev · Atom-excited atom exchange interaction at large distances
219 R K Janev and A R Tančić · Electron detachment in H-H⁺ and O-O⁺ collisions
224 L L Boyle and L Crawford Jones · Determination of hypervirial theorems from irreducible tensors
228 R G Wilson · A perturbation treatment of the unrestricted Hartree-Fock equations for the ground states of 3- to 10-electron atoms
241 D J Newman and C D Taylor · Configuration interaction in rare-earth ions I. Three particle correlation in Pr³⁺
248 J R Coaton and N J Phillips · The influence of convection and thermal diffusion on halogen separation in vertical burning linear tungsten-halogen lamps
258 M M Rebbeck and J M Vaughan · Unidentified diffuse bands in the spectrum of potassium
261 K P Singh, R M Singru and C N R Rao · Positron lifetime studies in organic media
269 S V J Lakshman and T V Ramakrishna Rao · RKR curves, r-centroids and Franck Condon factors for certain bands of AsO and AsO⁺ molecules

NO 3 MARCH 1971

Letters to the editor

- L11 R F Barrow and L Pedersen · Rotational analysis of the system B¹Π-²Σ⁺ of gaseous ScF

Review paper

- 279 B E J Pagel · Importance of spectral line shapes in astrophysics

Papers

- 288 W H King · The estimation of mass shifts in optical isotope shifts
296 J P Desclaux, C M Moser and G Verhaegen · Relativistic energies of excited states of atoms and ions of the second period

Contents

- 311 *R G Wilson* · A perturbation treatment of the Hartree-Fock equations for the ground states of 3- to 10-electron atoms
- 314 *J McI Calvert and W D Davison* · The multi-configuration frozen core approximation I. Eigenstates of the two-electron atom
- 332 *M Heaton and B L Moisewitsch* · Virial theorem for variational functions in collision theory
- 343 *J B Hasted, S M Iqbal and M M Yousaf* · Curve-crossing in single electron capture collisions
- 365 *D N Tripathi and D K Rai* · Importance of the kinetic energy expression for the bound electron in the binary collision theory of ionization
- 368 *J Comer and F H Read* · Potential curves and symmetries of some resonant states of H_2^-
- 389 *D Andrick and F H Read* · Angular distributions for the excitation of vibronic states by resonant electron molecule reactions
- 397 **Book review**
- 398 **Book notices**

NO 4 APRIL 1971

Letters to the editor

- L15 *P Jaye* · On a mechanism of secondary emission of polyatomic particles
- L18 *M Vujović, M Matić, B Čobić and Yu S Gordeev* · Analysis of metastable state population in fast ion beams
- L20 *B Sayer, R Wang, J C Jeannot and M Sassi* · Absorption measurements of quadrupole transition probabilities $6S-nD$ in caesium vapour
- L23 *J M Levy-Leblond* · Nonexistence of the ion H^{--}
- L26 *J B P Wickes, K J Ross and W R Newell* · Autoionization spectrum of cadmium vapour by electron impact

Papers

- 399 *T E H Walker* · Relativistic contributions to the energies of atoms
- 408 *H G Venkatesh and N R Roy* · Formalism of angular momentum for an assembly of two-level systems
- 420 *P C Trivedi* · Wave functions for H_2^+
- 424 *Noralf Björnd* · Constrained SCF theory for a closed-shell ground state
- 433 *K M S Saxena* · Self-consistent field with exchange for U^{6+}
- 437 *H R J Walters* · Integral equation method for the determination of the scattering amplitude
- 450 *R E Imhof and F H Read* · A new electron-photon coincidence method for the measurement of lifetimes in atoms and molecules
- 461 *A L Sinfailam and D G Thompson* · The Pople-Schofield approximation in the calculation of polarizabilities and polarization potentials
- 468 *D G Thompson* · The elastic scattering of electrons by nitrogen, neon, phosphorus and argon atoms
- 483 *P N Clout and D W O Heddle* · Electron impact excitation of argon II lines

Contents

- 494 *O H Crawford and A Dalgarno* · The scattering of thermal electrons by carbon monoxide
- 503 *C Gausorgues and A Salin* · Differential and total cross sections for excitation of the $n = 2$ level of hydrogen by proton impact
- 513 *R Peterkop* · WKB approximation and threshold law for electron-atom ionization
- 522 *D Wanstall* · Electron-ion recombination in argon
- 528 *P J Harbour* · The detection and ionization potential of mercury clusters
- 531 *W J Sandle and O M Williams* · A classical approach to coherence narrowing during multiple scattering of resonance radiation (linear polarization case)
- 555 *F Rostas and J L Lemaire* · Low pressure measurement of the broadening and shift of the caesium 4555 Å and 4593 Å lines by helium and argon
- 565 *M Singh* · A new electronic state of MgO
- 568 *J M Farr and W R Hindmarsh* · Collision broadening in the strontium resonance line, λ 4607 Å
- 574 *B R K Reddy, Y P Reddy and P T Rao* · The visible emission spectrum of strontium moniodide
- 579 *P S Dube and D K Rai* · Electronic transition moment variation in $D^{1}\Pi-x^{1}\Sigma$ system of SnO molecule and determination of the effective vibrational temperature
- 584 *W L Smith* · Moment analyses of intensity distributions in molecular electronic spectra
- 593 *I C Story, V I Metchnik and R W Parsons* · The measurement of the widths and pressure-induced shifts of microwave spectral lines
- 609 *A Kawski, J Kaminski and E Kutek* · Quenching of photoluminescence of solutions by electronic excitation transfer
- 621 *J H Dymond* · High temperature transport coefficients for the rare gases neon to xenon

Corrigendum

- 628 *D W Norcross* · Uniqueness of solutions of the close-coupling equations for electron scattering
- 628 *C Bottcher* · Resonance widths in electron-heavy atom scattering

629 Book reviews

NO 5 MAY 1971

Letters to the editor

- L29 *F P Larkins* · Dependence of fluorescence yield on atomic configuration
- L32 *S Bashkin, G W Cariveau and H J Hay* · Charge identification for spectral lines in nitrogen
- L36 *B Landheer and A V Durrant* · Calculation of Spectral line profiles for combined Doppler and Lorentz broadening

Papers

- 631 *J P Desclaux, D F Mayers and F O'Brien* · Relativistic atomic wave functions
- 643 *W R Garrett* · Variational method for elastic scattering involving long range forces
- 652 *D W Norcross* · Photoionization of the He metastable states

Contents

- 658 *Vo Ky Lan* · The method of polarized orbitals I: Elastic scattering of slow electrons by alkali atoms
- 670 *N Feautrier, H Van Regemorter and Vo Ky Lan* · The method of polarized orbitals II: The close coupling method using a polarized orbital expansion
- 681 *V Hasson and R W Nicholls* · Absolute absorption oscillator strength measurements on the ($a^3\Pi - x^1\Sigma$) Cameron band system of CO
- 684 *W R Newell, K J Ross and J B P Wickes* · Generalized oscillator strengths in the electron impact spectra of cadmium vapour
- 690 *I V Hertel and K A Rost* · Application of the second Born approximation to the 3s-4s excitation of sodium by electron impact
- 697 *D R Flower* · Collision strengths for electron excitation of highly ionized, complex atoms
- 706 *T F M Bensen and D Banks* · Angular distribution of electrons ejected by charged particles III: Classical treatment of forward ejection
- 715 *G Tondello and R W P McWhirter* · Measurements of excitation rate coefficients for singlet and triplet transitions of neon VII
- 728 *S Hameed* · Polarizability tensors of metastable $^3P_2$ neon
- 732 *W M Benesch and K A Saum* · The $w^3\Delta_u$ state of molecular nitrogen
- 739 *K B Garg, Q S Kapoor and A N Nigam* · Satellite $L\beta_2^1$ in x ray spectra of rare earths
- 741 *E L Lewis, M M Rebbeck and J M Vaughan* · Resonance broadening in the spectrum of potassium
- 748 *M A Ali* · Absolute multiplet strengths of $4^2S \rightarrow 4^2P \rightarrow 4^2D$ transitions of sodium sequence
- 752 *A G Gaydon and I Kopp* · Predissociation in the spectrum of OH; a reinterpretation

NO 6 JUNE 1971

Letters to the editor

- L39 *K C Mathur, A N Tripathi and S K Joshi* · Elastic scattering of electrons by lithium atoms using modified Glauber approximation
- L41 *A R Holt, J Hunt and B L Moiseiwitsch* · Forward elastic scattering of electrons by helium
- L44 *V B Sheorey* · Quantum defects for He I and Li II
- L47 *D R Bates and D Spreng* · Translation factor in basis functions used in perturbed stationary state approximation and capture in $H^+ - H(1s)$ collisions

Papers

- 759 *I Kovacs and V M Korwar* · General theory of the rotational structure of $^4\Sigma$ states of diatomic molecules I
- 776 *Y Singh and S Singh* · Preaveraged potential and the third virial coefficient of polar gases
- 786 *P C Pandey, K K Kirty and S L Srivastava* · Collision broadening of the OCS J_1-2 line by non-polar perturbers
- 791 *B S Rao* · Vibration-rotation band strengths and dipole moment function of the $H^{79}Br$ molecule
- 797 *R E Smith and A G Gaydon* · The spectrum of titanium hydride, TiH and TiD

Contents

- 800 *H B Gilbody, K F Dunn, R Browning and C J Latimer* · Formation of metastable helium atoms by electron capture during the passage of fast He^+ ions through gases
- 814 *L A Parcell and A D Stauffer* · Evaluation of matrix elements by a method of steepest descents
- 819 *S A Lebedeff* · Large angle behaviour of the scattering amplitude in the narrow wave packet approximation
- 836 *A S Ghosh and N C Sil* · Inelastic proton-hydrogen scattering by Glauber approximation
- 841 *W L Kennedy* · The relation between the Sandle-Williams alignment tensor and the density matrix for an ensemble of excited state atoms
- 849 *C G Carrington and A Corney* · Pressure broadening of the Hanle effect in a neon discharge
- 869 *C G Carrington and A Corney* · Theoretical cross sections for alignment destroying collisions in the 2p levels of neon

Corrigenda

- 886 *S P Khare* · Mean energy expended per ion pair by electrons in atmospheric gases
- 886 *R McCarroll and R D Piacentini* · Differential cross sections for elastic scattering, resonant charge exchange and excitation in low energy proton-hydrogen collisions
- 886 *C Gaussorgues et al.* · Exchange excitation of the 2s state of hydrogen in close collision with protons
- 886 *G P Srivastava and M L Goyal* · Microwave absorption in the hydrogen-bonded molecule $\text{CF}_3\text{COOH-HCOOH}$

NO 7 JULY 1971

Letters to the editor

- L53 *M H Brennan and R Morrow* · Proton-hydrogen atom momentum transfer cross section at ~ 5 eV

Papers

- 887 *P Pacher* · General form of the second centrifugal correction of rotational terms of diatomic molecules
- 892 *M R Flannery* · The binary encounter theory for a general interaction
- 896 *G Chatterjee and M R C McDowell* · Electron capture by fast protons in He and H_2
- 911 *F H Read and D Andrick* · Angular distributions for the excitation of rotational states by resonant electron molecule reactions
- 918 *I C Percival and D Richards* · Excitation of highly excited hydrogenic ions and atoms by charged particles II
- 932 *I C Percival and D Richards* · Excitation of highly excited hydrogenic ions and atoms by charged particles III
- 940 *J Byrne* · A classification of electron and optical polarization transfer matrices
- 954 *J Byrne and P S Farago* · Faraday rotation of electron spin polarization
- 962 *D R Bates, P B Hays and D Spreng* · Kinetic energy of ion pairs in three-body ionic recombination

Contents

- 969 *D N Stacey* · Isotope shifts in electronic and muonic atoms, with application to neodymium
- 976 *G B Deodhar and S Rai* · Decisive criterion for determination of spin doublets in x ray diagram lines
- 981 *B C Fawcett* · Classifications in the period between calcium and iron of emission lines isoelectronic with those of carbon, nitrogen, oxygen and fluorine
- 986 *B C Fawcett, A H Gabriel and T M Paget* · New observations of the spectra of argon X to XV and of isoelectronic emission lines in silicon VII to X, phosphorus X, sulphur IX to XII and chlorine X to XIV

NO 8 AUGUST 1971

Letters to the editor

- L57 *V B Sheorey, E Gerjuoy and B K Thomas* · Comparisons of the Glauber and Vainshtein approximations for inelastic electron-hydrogen scattering
- L61 *J Reinhardt, R I Hall, G Joyen and J Maseau* · Resonance phenomena in the low energy electron impact excitation of helium by a trapped electron method

Papers

- 995 *Z V Chraplyvy* · Approximate evaluation of the relativistic correction in potential scattering of charged particles
- 1008 *M Allegrini and E Arimondo* · Radiofrequency transitions in a dressed atom
- 1013 *B Corrigan and R Wallace* · Coupled state calculations of proton-hydrogen atom scattering with nonlinear trajectories
- 1020 *W K Peterson, C B Opal and E C Beatty* · Energy distributions of electrons ejected in ionizing collisions of electrons with helium
- 1026 *R McCarroll and R D Piacentini* · Rotational coupling effects on the differential elastic and inelastic cross sections in $\text{He}^+ - \text{He}$ collisions
- 1040 *V Sidis and H Lefebvre-Brion* · A 'quasi-diabatic' representation for inelastic collisions. Application to the scattering of He^+ by Ne
- 1055 *J Comer and F H Read* · Electron impact studies of a resonant state of N_2^-
- 1063 *R E Imhof and F H Read* · Measured lifetimes of the $c^3\Pi_u$ state of N_2 and the $a^3\Sigma_u^+$ state of H_2
- 1070 *M Druetta, M C Pouilzic and P Ceyzeriat* · Radiative mean lives of oxygen v states
- 1076 *B Ritchie* · Linear perturbation to molecular vibrational states due to long-range polarization in highly excited and scattering electronic states: reduction factors for the Franck-Condon overlap
- 1080 *G Wendin* · Collective effects in atomic photoabsorption spectra I
- 1096 *J C McCallum and R W Nicholls* · Franck-Condon factors and related quantities for the Fox-Duffendack-Barker ($\Delta\Pi^2_u - x \Pi_u$) and ultraviolet doublet ($b^2\Sigma_u - x^2\Pi_u$) band systems of Co_2^+
- 1102 *R L Matcha and C W Kern* · Relationships between spin-spin and electron repulsion integrals
- 1109 *M Cohen, R P McEachran, S Cameron and J A Stauffer* · Lower bounds to energy levels of two-electron atoms

Contents

- 1115 *B C Fawcett* · Spectral line classification in the period between fluorine and silicon, of transitions between levels of principle quantum numbers 3 and 4
1119 *G B Deodhar and S Rai* · Quasi-stationary states and some $L\alpha$ satellites of metallic silver

NO 9 SEPTEMBER 1971

Letters to the editor

- L67 *E Karule* · On the evaluation of transition matrix elements for multiphoton processes in atomic hydrogen
L70 *Ya A Teplova, I S Dmitriev and V S Nikolaev* · On electron loss and capture cross sections for multiply charged ions in solid matter
L72 *G J Peri* · The thermodynamics of multiphoton processes
L76 *D D Burgess, A G Richards and R Mahon* · A new technique for the optical generation of electron plasma waves

Papers

- 1123 *I Kovács and B Vujisić* · Centrifugal distortion of the spin-orbit and spin-rotation interaction for doublet terms
1129 *T W Preist* · The density of states in the static screened Coulomb potential
1140 *C Bottcher* · An iterative perturbation solution of the inverse potential problem
1150 *R Snyder* · A formula for relativistic atomic energies
1163 *L G Christophorou, D L McCorkle and V E Anderson* · Swarm-determined electron attachment cross sections as a function of electron energy
1173 *A B Wittkower and H D Betz* · Charge changing cross sections for heavy ions in complex molecules: the failure of an 'additive' rule
1176 *K L Aitken and M F A Harrison* · Measurement of the cross sections for electron impact ionization of multi-electron ions: I. O^+ to O^{2+} and O^{2+} to O^{3+}
1189 *K L Aitken, M F A Harrison and R D Rundel* · Measurement of the cross section for electron impact ionization of multi-electron ions: II. N^{2+} to N^{3+} and C^+ to C^{2+}
1200 *A V Durrant and B Landheer* · Forward scattering of resonance radiation by mercury vapour in a magnetic field
1210 *M Naon and M Cornille* · Correlation effects in x rays and electronic intensities for the neon atom
1222 *C G Carrington* · On the classical model for resonance fluorescence
1230 *U Frisch and A Brissaud* · On the validity of the unified classical path treatment of Stark broadening
1236 *R C M Learner and J Morris* · Autoionizing even levels in the mercury arc spectrum

NO 10 OCTOBER 1971

Letters to the editor

- L81 *D J Mitchell, B W Ninham and P Richmond* · Exact interaction energy between two anisotropic polarizable dipoles
L83 *V Dose and W Hett* · Collisional quenching of metastable deuterium

Contents

- L85** *W Hayes and F C Brown* · Absorption of BF_3 gas in the extreme ultraviolet
L88 *C R Middleton, M F Payne and A C Riviere* · Dissociation of H_3^+ ions at 410, 510 and 550 keV in H_2 gas
L91 *J Wykes* · A general optical detector of the polarization of low energy electrons
L94 *D D Burgess and N J Peacock* · Reduced limits on the magnitude of possible plasma polarization shifts

Papers

- 1243** *E Holsten and J Midtdal* · Variational nonrelativistic calculations for the $(2pnp)^{1,3}P^o$ states of two-electron atomic systems
1250 *A V Tankhileva, P L Khare and C Mande* · Application of the Z effective values of hydrogenic wavefunctions in the calculation of the K-LL Auger energies
1255 *R G Wilson and I Eliezer* · The third-order Hartree-Fock energy for the $1s2s^{1,3}S$ states of helium-like ions
1257 *O J Orient* · The mobility of mass-identified protons in helium gas
1267 *A B Rakshit* · Relative merits of the preaveraging and equal probability approximations for dipole-dipole interaction in polar gases
1270 *C R Garibotti and P A Massaro* · A variational approach to the scattering of fast electrons by hydrogen and helium atoms
1279 *T N Rescigno and W P Reinhardt* · Extraction of accurate scattering information from apparently divergent Fredholm series: the centrifugal barrier
1288 *S Geltman* · A high energy approximation: I. Proton-hydrogen charge transfer
1299 *S Geltman and M B Hidalgo* · A high energy approximation: II. Hydrogen atom excitation by electrons
1308 *K L Bell and A E Kingston* · Photoionization cross sections for the helium iso-electronic series
1318 *A R Holt, J Hunt and B L Moiseiwitsch* · Application of a simplified second Born approximation to the scattering of electrons and protons by helium atoms
1332 *P Baltayan and O Nédélec* · Polarization of molecular lines by electron impact. United atom and Born approximations
1343 *D S Walton, B Peart and K T Dolder* · A measurement of cross sections for detachment from H^- by a method employing inclined ion and electron beams
1349 *D J Bradley, G M Gale and P D Smith* · Stimulated Stokes and anti-Stokes electronic Raman scattering by selectively excited potassium and rubidium atoms
1353 *J E Jenkins and D D Burgess* · Experimental studies of helium line broadening in a plasma: I. High electron densities
1364 *D D Burgess and C J Cairns* · Experimental studies of helium line broadening in a plasma: II. Low electron densities (lines with forbidden components)
1377 *K S Barnes* · Quantum mechanical calculations of the electron impact broadening of isolated ion lines
1388 *G M Copland, D J Newman and C D Taylor* · Configuration interaction in rare earth ions: II. Magnetic interactions
1393 *C V Rama Mohan and J Sobhanadri* · Temperature dependence of ^{35}Cl NQR frequency in HgCl_2
1395 *J Singh and H Mohan* · Thermally excited emission spectrum of barium monofluoride
1398 *K C Abraham and M M Patel* · Fine structure analysis of the C_1 system ($\lambda 2600$ – $\lambda 2700\text{\AA}$) of the SbF molecule

NO 11 NOVEMBER 1971

Letters to the editor

- L 99 *C Bottcher* · Unified classical path theories of pressure broadening
 L102 *A C Chen and J C Y Chen* · A note on the coulomb Green function
 L105 *M R C McDowell and D Richards* · The on-shell coulomb T matrix

Papers

- 1403 *R Benesch* · Algebraic determination of electron-nuclear and electron-electron distribution functions from Hylleraas type wavefunctions
 1415 *G F Musso and V Magnasco* · Evaluation of four-centre molecular integrals
 1422 *M Jones* · Mutual spin-orbit and spin-spin interactions in atomic calculations
 1440 *R Peterhop and L Rabik* · Effect of inaccuracy of atomic wavefunctions in variational calculations of scattering length
 1450 *A K Barua, S Saha and K Mullick* · On the asymmetry in the angular distribution of the fragments produced from the collisions induced dissociation of HD^+ ion
 1458 *D W Norcross* · Low energy elastic scattering of electrons by Li and Na
 1476 *M Schulz* · Evaluation of a Coulomb integral for particle scattering
 1482 *O Bely, S B Schwartz and J L Val* · Autoionization structure in the ionization of Ba^+ by electron impact
 1488 *R W McCullough and H B Gilbody* · Ionization of potassium by 20–100 keV protons
 1496 *B Pearl and K T Dolder* · Collisions between electrons and H_2^+ ions:
 I. Measurements of cross sections for proton production
 1506 *J Dutton and J M Powell* · The influence of Penning ionization on the experimental determination of ionization coefficients in helium at low values of E/N
 1516 *J B Birks, H Y Najjar and M D Lumb* · Energy transfer in organic systems:
 XI. Temperature dependence of singlet excitation transfer and quenching in toluene solutions
 1523 *W S Bardo and D C Laine* · On detuning phenomena in cascaded cavity molecular beam masers
 1536 *F M Harris and G J Jones* · Drift velocities of electrons in sulphur hexafluoride
 1541 *N Konjevic, M Platisa and J Puric* · Electron impact broadening of ionized chlorine lines
 1548 *K E Grew and W A Wakeham* · A redetermination of the thermal diffusion factor for some inert gas mixtures: I
 1564 *W A Wakeham* · Dimers and the thermal diffusion factor at low temperatures
 1577 *B C Fawcett* · Classification of Fe XI to XV emission lines from $3s^23p^n$ – $3s3p^{n+1}$ and $3p^n$ – $3p^{n-1}3d$ transitions and isoelectronic spectra in manganese, chromium and vanadium
 1587 *A G Chalmers and M E Pillow* · The influence of N_2 and CO impurities on the spectral emission from a mercury-argon discharge
 1593 *M Naon, M Cornille and M Roux* · Compton profiles for the first and second row atoms
 1602 **Corrigendum**
 1603 **Book notices**

NO 12 DECEMBER 1971

Letters to the editor

- L107 *P Sitz* · Comment on Lower bounds to energy levels of two-electron atoms
 L109 *G S Khandeवाल and J E Shelton* · Algebraic equations for cross sections for excitation of H atoms to np or nd states by fast protons
 L112 *A P Clark and A S Dickinson* · Correspondence principle methods applied to a forced harmonic oscillator
 L116 *A S Dickinson* · Some properties of the screened coulomb potential
 L121 *N Urata and T Watanabe* · Validity of Pradhan's impulse approximation for high energy charge transfer processes
 L125 *A Salin* · Charge exchange between protons and atomic hydrogen: Comparison between theory and experiment
 L127 *R K Janev and A Salin* · Charge exchange in hydrogen atom collisions
 L129 *H-J Beyer and H Kleinpoppen* · Fine structure measurements in He^+ , $n = 4$. I. Intervals S-F

Papers

- 1605 *G M Copland, C D Taylor and D J Newman* · Configuration interaction in rare earth ions: III. Trees parameters for Pr^{2+} and Pr^{3+}
 1611 *P S Bagus, A Hibbert and C Moser* · Multiconfiguration Hartree-Fock calculations: IV. Calculations of the $2p^3$ and $2p^4$ isoelectronic series
 1633 *I Kovacs and P Pacher* · General theory of the rotational structure of $^4\Sigma$ states of diatomic molecules: II
 1640 *R Lee* · The unified theories of line broadening
 1649 *M R C McDowell* · A phase shift analysis of electron-atom scattering
 IV. Scattering of slow electrons by neon and argon
 1661 *C G Gray* · Theory of collision-induced absorption for spherical top molecules
 1670 *G Peach* · Ionization of atoms and positive ions by electron and proton impact
 1678 *J Comer and F H Read* · Resonance scattering of electrons from CO
 1683 *F B Dunning, A C H Smith and R F Stebbings* · Secondary electron ejection from metal surfaces by metastable atoms: I. Measurements of secondary emission coefficients using a crossed beam method
 1696 *F B Dunning and A C H Smith* · Secondary electron ejection from metal surfaces by metastable atoms: II. Measurements of secondary emission coefficients using a gas cell method
 1711 *K Birkinshaw and J B Hasted* · Inelastic collisions between atomic ions and diatomic molecules
 1726 *M R Mahdavi, J B Hasted and M M Nakshbandi* · Electron-ion recombination measurements in the flowing afterglow
 1738 *D C Laine and W S Bardo* · Multiple population inversion in a beam maser
 1743 *R Girardeau, E J Krystautas, G Beauchemin sj, B Neveu and R Drouin* · Equilibrium charge distributions of C, N, O, and Ne in carbon foil
 1747 *M Swartz, S Kastner, E Rothie and W Neupert* · Soft x ray spectra of Cr, Mn, Fe, Co, Ni, Cu, classification in Ne I, F I, O I, N I, and C I isoelectronic sequences
 1769 *V Hasson and R W Nicholls* · Absolute spectral absorption measurements of the $\text{NO}-\beta$ ($n^2\Pi-x^2\Pi$) band system of nitric oxide

Contents

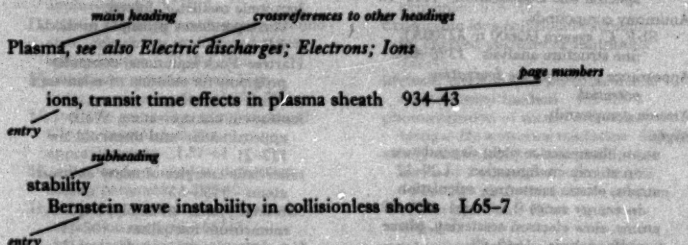
- 1778 *V Hasson and R W Nicholls* · Absolute spectral absorption measurements on molecular oxygen from 2640–1920Å: I. Herzberg I ($\lambda^3\Sigma_u^+ - x^3\Sigma_g^-$) bands (2640–2430 Å) 1778
- 1789 *V Hasson and R W Nicholls* · Absolute spectral absorption measurements on molecular oxygen from 2640–1920Å: II. Continuum measurements 2430–1920Å 1789
- 1798 *D C Bishop and W H King* · Isotope shifts in the resonance lines of Cd II and Sn IV and the size of specific mass shifts in alkali like resonance lines 1798

Subject index

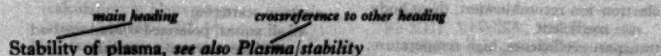
Introduction

The entries in this index refer to the papers and letters by their page number. The entries are grouped under headings. If a heading for a particular subject does not appear, the subject may be in the form of a crossreference to another heading, perhaps of a more general nature. Many of the headings are subdivided by the use of subheadings, which are indented (ie printed slightly to the right) and commence with a small letter.

The information contained in the subject index is illustrated by the following example:



Associated with the main heading 'Stability of plasma' is a 'see' crossreference as follows:



This means that for papers on 'Stability of plasma' the reader should consult the subheading 'stability' of 'Plasma' as displayed above.

Arrangement of headings and subheadings

The headings and crossreferences are arranged throughout the index in alphabetical order according to the 'word by word' system. The subheadings are themselves arranged in alphabetical order under their respective headings.

Arrangement of entries under headings

Entries are arranged in four distinct groups as follows:

- First group: arabic numerals
- Second group: English alphabet (A-Z), roman numerals, Greek alphabet (excluding elementary particles)
- Third group: elementary particle symbols, that is, the Greek and English alphabet, eg μ (muon), p (proton)
- Fourth group: chemical formulae (including entries beginning with nuclei, eg ^{57}Fe).

Nuclei

Papers on nuclei whose mass number (or mass number range) is given are listed under a set of headings which begin 'Nuclei ...', eg Nuclei with $6 \leq A \leq 19$ where A is the mass number.

Afterglow, *see Discharges, electric*

Alkali metals, *see also the individual metals*
atoms, polarized orbital method used
for electron scattering calculation
658-69

ionization of atom, electron impact,
importance of kinetic energy
expression for bound electron 365-7
polarized orbital method for calculation
on electron scattering from atoms
658-69

Aluminium

atoms, transitions between levels of
principle quantum numbers 3 and 4,
spectral line classification 1115-18

Antimony compounds

SbF₃, C₁ system (λ 2700Å),
fine structure analysis 1398-402

Appearance potential, *see Ionisation
potential*

Arsenic compounds

Argon

atom, fluorescence yield dependence
on atomic configuration L29-32
atoms, elastic scattering, calculation
in energy range 0 to 4 ryd 468-82
atoms, slow electron scattering, phase
shift analysis 1649-60
charge state dependence of X-ray and
Auger electron emission spectra
1-13
electron-ion recombination, three body
rate coefficient 522-7
transport coefficients, high temperature,
calculation 621-7

Ar⁺, charge exchange collisions with
N₂, CO, O₂, NO, rate coefficient
measurement 1711-25

Ar II, electron impact excitation of
upper laser levels 483-93

Ar X to XV, isoelectronic emission
lines observation 986-94

Ar-Ne mixture, thermal diffusion
factor measurement 1548-63

Hg-Ar discharge, spectral emission,
influence of N₂ and CO impurities
1587-92

Kr-Ar mixture, thermal diffusion
factor measurement 1548-63

AsO, AsO⁺, potential energy curves for
certain states, r -centroids, Franck-
Condon factors 269-78

Astronomical spectra, *see also Stars*
line breadth, role in astrophysics,
review 279-87

Atomic orbitals, *see Atoms/structure;
Orbital calculation methods*

Atomic spectra, *see Spectra/atoms*

Atoms, *see also Atoms/mesic and muonic;*

Collision processes/atoms;

Polarisability

Compton profiles, first and second row
atoms 1593-601

Coulomb Green function, equivalence
of expressions L105-6

Coulomb potential, screened,
properties L107-8

Coulomb T-matrix, on-shell L102-4
energy, relativistic contributions
399-407

excited state ensemble, relation between
Sandle-Williams alignment tensor
and density matrix 841-8

harmonic oscillator, forced,
correspondence principle methods
LE

Hartree-Fock equations, computer
programs for solution of relativistic
forms 631-42

ionization, electron-atom, WKB
approximation and threshold law
513-21

relativistic energies of many electron
atoms 1150-62

two-level system assembly, angular
momentum formalism 408-19

H⁺ electron capture in H₂ and He
896-910

He⁻, decay in flight study under
field free conditions 106-10

electron scattering

alkali atoms, polarized orbital method
used for electron scattering
calculation 658-69

alkali metal atoms, electron impact
ionization cross-section calculation
365-7

Faraday rotation of electron spin
polarization 954-61

ions, positive, ionization cross section
calculation 1670-7

ionization, cross section calculation
1670-7

ionization, electron impact, importance
of kinetic energy expression for
bound electron 365-7

polarization, at low energies, general
optical detector L91-4

polarized orbital method applied to
alkali atoms 658-69

spin exchange collision described in
terms Stokes parameters 954-61
theory, expression of target states as
linear sums of configurations
153-61

Ar, elastic scattering, calculation in
energy range 0 to 4 ryd 468-82

- Ar, slow electron scattering, phase shift analysis 1649-60
- Ba⁺, ionization by electron impact, autoionization structure 1482-7
- Ca⁺, spectral line broadening, quantum mechanical calculation 1377-87
- Fe XIII, XIV, XV, XVII ions, collision strengths for electron excitation 697-705
- H, approximation methods on scattering of fast electrons and positrons 79-87
- H, elastic scattering cross sections, calculation using rational Pade approximants 1270-8
- H, elastic exchange scattering on ground state, calculation in distorted wave approximation 71-8
- H, excitation cross sections, high energy approximation 1299-307
- H, inelastic scattering, comparisons of Glauber and Vainshtein approximations L57-61
- H, virial theorem used to determine scaling parameter 332-42
- H, e⁻ and e⁺ scattering, variational calculation method 643-51
- H, e⁺ scattering length, atomic wavefunction inaccuracy effect in variational calculation 1440-9
- He, elastic, differential cross section calculation in plane wave approximation 208-14
- He, elastic scattering cross sections, calculation using rational Pade approximants 1270-8
- He, forward elastic scattering, differential cross section L41-3
- He, simplified second Born approximation 1318-31
- He, solutions of coupled equations used to study photoionization 652-7
- Li, elastic scattering, modified Glauber approximation L39-41
- Li, low energy elastic scattering 1458-75
- Mg⁺, spectral line broadening, quantum mechanical calculation 1377-87
- N, elastic scattering, calculation in energy range 0 to 1 ryd 468-82
- N V, ion, collision strengths for electron excitation 697-705
- Na, electron impact excitation 3s-4s, application of second Born approximation 690-6
- Na, low energy elastic scattering 1458-75
- Ne, correlation effects in electronic intensities 1210-21
- Ne, elastic scattering, calculation in energy range 0 to 4 ryd 468-82
- Ne, slow electron scattering, phase shift analysis 1649-60
- P, elastic scattering, calculation in energy range 0 to 1 ryd 468-82
- Si XII, ion, collision strengths for electron excitation 697-705
- excitation, *see also Auger effect*
- hydrogenic ions, H atom, excitation by charged particle bombardment, study using Heisenberg's correspondence principle 918-31
- hydrogenic ions collisional excitation by charged particles of transitions 932-9
- lifetime, electron-photon coincidence measurement method 450-60
- photoionization of metastable states, using e-He scattering equations 652-7
- relativistic energies, computed for a series of J states, corresponding to 1s²s²2p² configurations by solution of Hartree-Fock-Dirac equations 296-310
- resonance radiation, classical approach to coherence narrowing during multiple scattering 531-54
- Ar II, upper laser levels, by electron impact 483-93
- Fe XIII, XIV, XV, XVII ions, collision strengths for electron excitation 697-705
- H, by electron impact, high energy approximation 1299-307
- H, 1s-2s and 1s-2p, by proton impact, Glauber approximation 836-40
- H, 2s and 2p states by proton impact, differential and total cross sections 503-12
- He, by low energy electron impact, resonance phenomena observation by trapped electron method L61-5
- He, by proton and electron impact, simplified second Born approximation 1318-31
- He, isoelectronic series, photoionization cross sections 1308-17
- K resonance broadening of spectra 741-7
- N V, ion, collision strengths for electron excitation 697-705
- Na, electron impact excitation 3s-4s, application of second Born approximation 690-6
- Ne VII rate coefficients for singlet and triplet transitions 715-27

- Si XII, ion, collision strengths for electron excitation 697-705
- mesic and muonic isotope shifts related to nuclear charge distribution 969-75
- structure, *see also Spectra/atoms*
- 2p⁸ isoelectronic series, multiconfiguration Hartree Fock calculation 1611-32
- 2p⁴ isoelectronic series, multiconfiguration Hartree Fock calculation 1611-32
- bound state calculation, inclusion of mutual spin-orbit and spin-spin interactions 1422-39
- density of states from Regge trajectories for screened Coulomb potential 1129-39
- excited state population, decay rate L1-4
- frozen core approximation, multiconfiguration, small importance of short range correlation 314-31
- ground state wave functions for atoms and ions with 4 to 10 electrons, Hartree-Fock calculation 311-13
- ground states, 3-10 electron atoms, perturbation treatment of Hartree Fock equations, 228-40
- two-electron atoms, lower bounds to energy levels 1109-14
- two-electron atoms, lower bounds to energy levels L125-6
- two-electron atoms and ions, electron-nuclear and electron-electron distribution functions, algebraic determination from Hylleraas type wave functions 1403-14
- two-electron systems, (2pnp)^{1,3} ² states, variational nonrelativistic calculations 1243-9
- Cd, 5²P_{1/2} state, population, decay rate L1-4
- H⁻, frozen core approximation, multiconfiguration, small importance of short range correlation 314-31
- H, ground state, elastic exchange scattering of electrons 71-8
- He, frozen core approximation, multiconfiguration, small importance of short range correlation 314-31
- He, iterative perturbation solution of inverse potential problem 1140-9
- He-like ions, 1s2s^{1,3}S states, third-order Hartree-Fock energy 1255-6
- He, multiconfiguration energy bound method for Feshbach type autoionization states 32-41
- HeI, quantum defects L44-7
- He⁺, fine structure splittings S-F, measurement using electric field induced anticrossing signals L129-32
- Hg, autoionizing even levels in arc spectrum 1236-42
- K⁺, iterative perturbation solution of inverse potential problem 1140-9
- Li, ground state wave functions for atoms and ions with 4 to 10 electrons Hartree-Fock calculation 311-13
- LiII, quantum defects L44-7
- Li⁺, iterative perturbation solution of inverse potential problem 1140-9
- Na⁺, iterative perturbation solution of inverse potential problem 1140-9
- Ne, iterative perturbation solution of inverse potential problem 1140-9
- Ne polarizability tensor of metastable state 728-31
- Ne VII rate coefficients for singlet and triplet transitions 715-27
- Pr⁴⁺, use of Hartree-Fock Slater wave functions to calculate Coulomb matrix elements in configuration interaction 241-7
- Pr³⁺, Pr²⁺, configuration interaction, Trees parameters 1605-10
- Auger effect
- K-L-L energies, calculation using Z effective values of hydrogenic wavefunctions 1250-4
- Ar, charge state dependence of electron emission spectra 1-13
- Ne, electron, emitted, energy dependence on degree of ionization investigation 14-19
- Autoionization, *see Ionization*
- Barium
- Ba⁺, ionization by electron impact, autoionization structure 1482-7
- Barium compounds
- BaF, thermally excited emission spectrum 1395-7
- Beta-ray polarization
- interaction represented by 4 × 4 transfer matrices, classification 940-53
- Binding energy
- Ar, electronic, various sub shells calculation using Hartree-Fock SCF procedure 1-13
- He, atom, by Faddeev formalism L5-6
- Ne, calculation using Hartree-Fock SCF procedure 14-19
- Boron compounds
- BF₃, absorption in extreme u.v. L85-8

Charge exchange

Cadmium

- atom, excited 5^2P_1 state, population, decay rate L1-4
- atomic spectra, electron impact, generalised oscillator strength 684-9
- electron emission, secondary, coefficient for metastable atoms, measurement by crossed beam method 1683-95
- electron emission, secondary, coefficient for metastable atoms, measurement by gas cell method 1696-1710
- vapour, autoionization by electron impact, spectrum, L26-8
- Cd II, isotope shifts in resonance lines, size of specific mass shifts in alkali-like resonance lines 1798-1807

Cadmium compounds

- CdTi, visible emission spectra, observation and vibrational analysis of red and blue systems 133-41
- CdTi₂, visible emission spectra, observation and vibrational analysis of red and blue systems 133-41

Caesium

- atomic spectra, 4555 and 4593 Å lines, low pressure measurement of broadening and shift by He and Ar 555-64
- vapour, quadrupole transition probabilities 6S-nD, absorption measurements L20-3

Calcium

- Ca⁺, spectral line broadening by electron impact, quantum mechanical calculation 1377-87

Carbon

- C⁻, on Ne, Ar, Kr, Xe and Na₂, cross sections for electron loss, 5-30 keV² 111-15
- C⁺, collision with C foil, equilibrium charge distributions 1743-6
- C⁺, electron impact ionization cross section, production of C²⁺ 1189-99
- C²⁺ in collision with He, Ne, Ar, 1-3 keV, electron capture probabilities observations, curve crossing diagnostics 343-64

Carbon compounds

- CO, absolute absorption oscillator strength measurements on Cameron band 681-3
- Co, resonance scattering of electrons 1678-82
- CO molecules, thermal electron scattering, close coupling calculations 494-502
- CO₂⁺, electron-ion recombination, measurement in flowing afterglow 1726-37

- CO₂, electron-molecule resonant reactions, vibronic transitions 389-96

- CO₂⁺, Fox-Duffendack-Barker and u.v. doublet band systems, Franck-Condon factors and related quantities 1096-101

- CO-Ar⁺ charge exchange collision, rate coefficient measurement 1711-25

- COS, microwave spectral lines, measurement of widths and pressure induced shifts 593-608

- atoms, high energy processes, validity of Pradhan impulse approximation LF

- proton H atom collisions, high energy approximation 1388-98

- Ar⁺, collisions with Na, CO, O₂, NO, rate coefficient measurement 1711-25

- H-H collisions, continuum distorted wave calculation of cross section L127-8

- H⁺-H, comparison between theory and experiment L121-4

- H⁺ + H $\rightarrow$ H + H⁺, high energy, validity of Pradhan impulse approximation L116-20

- N⁺-O₂, rate coefficient measurement 1711-25

Chlorine

- Cl X to XIV isoelectronic emission lines 986-94

Chromium

- atoms, soft X-ray spectra, classification 1747-68
- Cr X to XII, classification of emission lines from 3s²3p⁴-3s3p⁴+1 and 3p⁴-3p⁴-3d transitions 1577-86

Cobalt

- atoms, soft X-ray spectra, classification 1747-68

Coherence, *see* MasersCollision processes, *see also* Atoms/electron scattering; Ionisation

- elastic scattering involving long range forces, variational method 643-51
- three body rearrangement collisions, convergence of the Faddeev-Watson multiple scattering expansion 191-207

- virial theorem for variational functions, scaling parameter determination 332-42

atoms

- atom-excited atom exchange interaction at large distances, exact asymptotic expression 214-18

- binary encounter theory for a general interaction 892-5
- charge transfer processes, high energy, validity of Pradhan impulse approximation LF
- Heisenberg correspondence principle used to calculate collisional excitation cross-section for transitions 932-9
- hydrogenic ions collisional excitation by charged particles of transitions 932-9
- ions, multiply charged, electron capture and loss cross sections, in thin films L70-2
- ions, positive, proton impact ionization cross section calculation 1670-7
- ionization, by proton impact, cross section calculation 1670-7
- proton scattering, coupled state calculation with nonlinear trajectories 1013-19
- scattering, Coulomb integral evaluation 1476-81
- scattering, matrix elements, evaluation by method of steepest descents 814-18
- unitary transformations in impact parameter approximation, electron behaviour 42-52
- Ar⁺, charge exchange collisions with N₂, CO, O₂, NO, rate coefficient measurement 1711-25
- Ar⁺ - Ar, X-ray and Auger electron emission spectra 1-13
- C⁺, on Ne, Ar, Kr, Xe and N₂, cross sections for electron loss, 5-30 keV 111-15
- C⁺, electron impact ionization cross section, production of C³⁺ 1189-99
- C⁺, with C foil, equilibrium charge distributions 1743-6
- C²⁺ with He, Ne, Ar, 1-3 keV, electron capture probabilities observations, curve crossing diagnostics 343-64
- Cd, electron impact, autoionization spectrum L26-8
- H, metastable, fast, destruction in passage through H₂, He, Ne, Ar, Kr, N₂ 94-105
- H, part metastable, cross section calculations for electron loss in passage through atomic H and He 162-8
- H, proton impact excitation of 2s and 2p states, differential and total cross sections 503-12
- H, proton scattering, high energy approximation of charge transfer process 1288-98
- H⁺, electron detachment, cross section measurement using inclined beams 1343-8
- H⁺ + e → H⁺ + 3e, cross section measurement between 14 eV and 850 eV 88-93
- H - H⁺, electron detachment cross section, formula derivation 219-22
- H - H, charge exchange, continuum distorted wave calculation of cross section L127-8
- H⁺ - H at 5 eV, momentum transfer cross-section measurement L53-6
- H⁺ - H charge exchange, comparison between theory and experiment L121-4
- H⁺ - H(1s), capture, translation factor in basis functions used in perturbed stationary state approximation L47-51
- H⁺ + H → H + H⁺, high energy, validity of Pradhan impulse approximation L116-20
- He, ionizing collisions with electrons, energy distribution of secondary electrons 1020-5
- He, proton scattering, simplified second Born approximation 1318-31
- He⁺, fast, electron capture during passage through gases, formation of metastable He atoms 800-13
- He + H⁺, 100-300 keV, angular distribution of ejected electrons, classical orbit integration cross-section 706-14
- He⁺ - He, differential elastic and inelastic cross sections, rotational coupling effects 1026-39
- He⁺ - Ne, inelastic scattering, quasi-diabatic representation 1040-54
- K, ionization by 20 to 100 keV protons 1488-95
- N⁺, with C foil, equilibrium charge distribution 1743-6
- N²⁺, electron impact ionization cross section, production N³⁺ 1189-99
- N²⁺ with He, Ne, Ar, 1-3 keV, electron capture probabilities observations, curve crossing diagnostics 343-64
- N⁺ - O₂, charge exchange collision, rate coefficient measurement 1711-25
- Ne, alignment destroying collisions in 2p levels, theoretical cross sections 869-85
- Ne⁺, with C foil, equilibrium charge distribution 1743-6

- O⁻, on Ne, Ar, Kr, Xe and Na, cross sections for electron loss, 5-30 keV 111-15
- O⁺, electron impact ionization cross sections, production of O²⁺ 1176-88
- O⁺, with C foil, equilibrium charge distributions 1743-6
- O²⁺, electron impact ionization cross sections, production of O³⁺ 1176-88
- O²⁺ with He, Ne, Ar, 1-3 keV, electron capture probabilities observations curve crossing diagnostics 343-64
- O-O⁻, electron detachment cross section, formula derivation 219-22
- Sr, λ 4607 Å resonance line, collision broadening 568-73
- molecules
 - atom-molecule, mechanism of secondary emission of polyatomic particles L15-17
 - electron attachment cross sections, swarm determined function of electron energy 1163-72
 - electron capture and loss cross sections for 12 MeV iodine ions in complex molecules 1173-5
 - electron-molecule resonant reactions, vibronic transitions 389-96
 - rotational state excitation in resonant reactions 911-17
 - spherical-top molecules, collision-induced far i.r. rotation-translation spectrum, quantum theory 1661-9
- CO, resonance scattering of electrons 1678-82
- CO, thermal electron scattering, close coupling calculations 494-502
- CO₂, electron-molecule resonant reactions, vibronic transitions 389-96
- CO-Ar⁺, charge exchange collision, rate coefficient measurement 1711-25
- D₂, metastable, collisional quenching by H₂ L83-5
- H₂⁺, collisions with electrons, proton production cross section measurement 1496-1505
- HD⁺, electron impact dissociation, asymmetry in angular distribution of fragments 1450-57
- N₂ rotational state excitation in resonant reactions 911-17
- N₂, vibrational excitation by resonance scattering of electrons of 2-3 eV 53-70
- N₂-Ar⁺, charge exchange collision, rate coefficient measurement 1711-25
- NO-Ar⁺, charge exchange collision, rate coefficient measurement 1711-25
- O₂-Ar⁺, charge exchange collision, rate coefficient measurement 1711-25
- O₂-N⁺, charge exchange collision, rate coefficient measurement 1711-25
- Coulomb effect, *see Atoms*
- Compton effect
 - atoms, first and second row, Compton profiles 1593-601
- Convection
 - W- halogen lamps, influence on halogen separation 248-57
- Copper
 - atoms, soft X-ray spectra, classification 1747-68
 - electron emission, secondary, coefficient for metastable atoms, measurement by gas cell method 1696-1710
- Dark Space, *see Discharges, electric*
- Deuterium
 - metastable, collisional quenching by H₂ L83-5
- Diffusion in gases, thermal, *see also Scattering/light*
 - thermal diffusion factor, dimer formation effect at low temperature 1564-76
 - Ar-Ne mixture, thermal diffusion factor measurement 1548-63
 - Kr-Ar mixture, thermal diffusion factor measurement 1548-63
 - W- halogen lamps, halogen separation, effects of convection and thermal diffusion 248-57
- Discharges, electric, *see also Plasma*
 - Hg-Ar, spectral emission, influence of N₂ and CO impurities 1587-92
 - K, low power, explanation of observed diffuse bands 258-60
- Doppler effect
 - spectral line profile for combined Doppler and Lorentz broadening L36-8
 - N ions, charge determination using Doppler shift technique L32-6
- Electric discharges, *see Discharges, electric*
- Electrodynamics
 - charged particle motion in zero energy Coulomb field, correspondence identities 143-52
- Electron affinity, *see Atoms; Ionisation; Molecules*

Electron density

He plasma, high density effects on He line broadening 1353-63

He plasma, low density effects on He line broadening 1364-76

Electron emission, secondary

steel, stainless, secondary emission coefficient for metastable atoms, crossed beam measurement method 1683-95

steel, stainless, secondary emission coefficient for metastable atoms, gas cell measurement method 1696-1710

Au, secondary emission coefficient for metastable atoms, gas cell measurement method 1696-1710

Cd, secondary emission coefficient for metastable atoms, crossed beam measurement method 1683-95

Cd, secondary emission coefficient for metastable atoms, gas cell measurement method 1696-1710

Cu, secondary emission coefficient for metastable atoms, gas cell measurement method 1696-1710

W, secondary emission coefficient for metastable atoms, gas cell measurement method 1696-1710

Electrons, *see also Plasma*

drift velocity, in SF₆ 1536-40

ionization, alkali metal atoms, electron impact ionization cross-section calculation 365-7

scattering, CO molecules, thermal electron scattering, close coupling calculations 494-502

SF₆, drift velocity measurement * 1536-40

Emission spectra, *see Luminescence; Spectra; X-ray spectra/emission*

Equations of state

gas, polar, dipole-dipole interaction, relative merits of preaveraging and equal probability approximation 1267-9

gas, polar, preaveraged potential and third virial coefficient 776-85

Exchange interactions

atom-excited atom at large distances, exact asymptotic expression 215-18

Fluorescence

atomic excited states, decay rate L1-4

classical model for resonance

fluorescence 1222-9

toluene solutions, temperature dependence of singlet excitation transfer and quenching 1516-22

Ar, yield dependence on atomic

configuration L29-32

Cd, 5²P₁ excited states, decay rate L1-4

Fluorine

atoms, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18

Franck-Condon factors, *see Spectra*

Free radicals

OH predissociation reinterpreted 752-8

Glauber approximation, *see Atoms/excitation*

Gold

Electron emission, secondary, coefficient for metastable atoms, measurement by gas cell method 1696-1710

Green's function methods

Coulomb Green function, equivalence of expression L105-6

Halogens

separation in W- halogen lamps, influence of convection and thermal diffusion 248-57

Harmonic oscillator, *see Atoms; Molecules; Quantum theory*

Hartree-Fock method, *see also Orbital calculation methods*

computer programs for solution of relativistic forms 631-42

ground state wave functions for atoms and ions with 4 to 10 electrons

Hartree-Fock calculation 311-13

Hartree-Fock-Dirac equations used to calculate relativistic energies of excited states of atoms and ions of second period 296-310

perturbation treatment, ground states of 3-10 electron atoms 288-40

SCF procedure, electronic binding energy calculation of Ar sub shells 1-13

SCF procedure, calculation of Ne electron binding energy 14-19

wave functions for ground states of atoms and ions with 4 to 10 electrons 311-13

Pr²⁺, ³⁺, use of Hartree Fock Slater wave functions to calculate Coulomb matrix elements in configuration interaction 241-7

Helium

atom, binding energy by Faddeev formalism L5-6

atom, electron elastic scattering cross sections, calculation using rational Pade approximants 1270-8

- atom, ground state, frozen core approximation, multi-configuration, small importance of short range correlation 314-31
- atom, multiconfiguration energy bound method for Feabach type autoionization states 32-41
- atom, photoionization of metastable states, using e-He scattering equations 652-7
- atom, proton ejection of electrons, 100-300 keV, classical orbit integration cross-section 706-14
- atoms, elastic scattering of electrons, differential cross-section calculation in plane wave approximation 208-14
- atoms, excitation by low energy electron impact, resonance phenomena observation by trapped electron method L61-5
- atoms, forward elastic electron scattering, differential cross section L41-3
- atoms, ionizing collisions with electrons, energy distribution of secondary electrons 1020-5
- atoms, Penning ionization effect on experimental determination of ionization coefficients 1506-15
- atoms, spectral line broadening in plasma at high electron densities 1353-63
- atoms, spectral line broadening in plasma at low electron densities 1364-76
- electron scattering, simplified second Born approximation 1318-31
- inverse potential problem, iterative perturbation solution 1140-9
- isoelectronic series, photoionization cross sections 1308-17
- metastable atoms, formation by electron capture during fast He⁺ passage through gases 800-13
- proton scattering, simplified second Born approximation 1318-31
- He⁻, decay in flight study under field free conditions 106-10
- HeI, quantum defects L44-7
- He⁺, fast, electron capture during passage through gases, formation of metastable He atoms 800-13
- He⁺, fine structure splitting S-F, measurement using electric field induced anticrossing signals L129-32
- He⁺-He collisions, differential elastic and inelastic cross sections, rotational coupling effects 1026-39
- He⁺-Ne scattering, in elastic, quasi-diabatic representation 1040-54
- gas
- proton mobility, mass-identified 1257-66
- H⁺ electron capture in He and H₂ gas 896-910
- Hollow cathode, *see Discharges, electric*
- Hydrogen, *see also Deuterium*
- gas, electron capture by fast protons 896-910
- molecule, C³Πu state, lifetime measurement 1063-9
- ions
- electron capture in He and H₂ gas 896-910
- hydrogenic, excitation by charged particle bombardment, study using Heisenberg's correspondence principle 918-31
- H⁻, electron detachment, cross section measurement using inclined beams 1343-8
- H⁻ + e H⁺ + 3e, cross section measurement between 14eV and 850eV 88-93
- H²⁺, proof of nonexistence of stable bound state L23-6
- H₂⁻ potential curves and symmetries of resonant states 368-88
- H₂⁺, collisions with electrons, proton production cross section measurement 1496-1505
- H₂⁺, wave functions 420-3
- H₂⁺, dissociation in H₂ gas at 410, 510 and 550 keV, atom yield measurement L88-91
- HD⁺, electron impact dissociation, asymmetry in angular distribution of fragments 1450-57
- H⁺-H at 5eV, momentum transfer cross-section measurement L53-6
- H⁺-H charge exchange, comparison between theory and experiment L121-4
- H⁺+H→H+H⁺, high energy, validity of Pradhan impulse approximation L116-20
- H⁺-H(1s) collisions, capture, translation factor in basis functions used in perturbed stationary state approximation L47-51
- neutral atoms
- approximation methods on scattering of fast electrons and positrons 79-87
- e⁺ scattering length, atomic wave-function inaccuracy effect in variational calculation 1440-9
- electron elastic scattering cross sections, calculation using rational

- Pade approximants 1270-8
 electron scattering, inelastic, comparisons of Glauber and Vainshtein approximations L57-61
 electron scattering, variational calculation method 643-51
 electron scattering, virial theorem used to determine scaling parameter 332-42
 excitation by charged particle bombardment, study using Heisenberg's correspondence principle 918-31
 excitation, 1s-2s and 1s-2p, by proton impact, Glauber approximation 836-40
 excitation, 2s and 2p states, by proton impact, differential and total cross sections 503-12
 ground state, elastic exchange scattering of electrons 71-8
 metastable, fast, collisional destruction in passage through H₂, He, Ne, Ar, Kr, N₂ 94-105
 multiphoton processes, transition matrix elements L67-70
 part metastable, cross section calculations for electron loss in passage through atomic H and He 162-8
 proton collisions, high energy approximation of charge transfer process 1288-98
 proton scattering, coupled state calculation with nonlinear trajectories 1013-19
 H⁺, frozen core approximation, multiconfiguration, small importance of short range correlation 314-31
 H, electron impact excitation, high energy approximation 1299-307
 H-H collisions, charge exchange, continuum distorted wave calculation of cross section L127-8
 H-H⁺, collisions, electron detachment cross section, formula derivation 219-22
 H(1s)-H⁺ collisions, capture, translation factor in basis functions used in perturbed stationary state approximation L47-51
 H-H⁺ at 5 eV, momentum transfer cross section measurement L53-6
 neutral molecules
 collisions, with metastable D₂, quenching of D₂ L83-5
 H¹⁹⁹Br, dipole moment function, from vibration-rotation band strengths 791-6
 Hypervirial theorem, *see Quantum theory*
 Infrared spectra, *see Spectra*
 Interference spectroscopy, *see Spectroscopy*
 Ion beams
 fast metastable state population, analysis method L18-20
 Ion velocity
 He, mobility of mass-identified protons 1257-66
 Ionization, *see also Photoionization*
 alkali metal atoms, electron impact ionization cross-section calculation 365-7
 atoms, by electron and proton impact, cross section calculation 1670-7
 electron-atom, WKB approximation and threshold law 513-21
 electron impact, importance of kinetic energy expression for bound electron 365-7
 ions, positive, by electron and proton impact, cross section calculation 1670-7
 Ba⁺, by electron impact, autoionization structure 1482-7
 C⁺, electron impact ionization cross section, production of C³⁺ 1189-99
 Cd vapour, autoionization by electron impact, spectrum L26-8
 H, transition matrix elements for multiphoton processes L67-70
 He atoms, proton bombardment, 100-300 keV, classical orbit integration cross-section 706-14
 He, ionizing collisions with electrons, energy distribution of secondary electrons 1020-5
 He, Penning ionization effect on experimental determination of ionization coefficients 1506-15
 He isoelectronic series, photoionization cross sections 1308-17
 Hg, emission line broadening by autoionization 1236-42
 K, ionization by 20 to 100 keV protons 1488-95
 Na, autoionization rate variation with separation of nuclei 53-70
 N³⁺, electron impact ionization cross section, production of N³⁺ 1189-99
 O⁺, electron impact ionization cross sections, production of O³⁺ 1176-88
 O³⁺, electron impact ionization cross sections, production of O³⁺ 1176-88
 Ionization potential
 Hg clusters, measurement 528-30
 Ions, *see also Atoms; Molecules; Plasma*
 electron capture and loss cross sections, in thin films L70-2

- hydrogenic, excitation by charged particle bombardment, study using Heisenberg's correspondence principle 918-31
- N, charge determination using Doppler shift technique L32-6
- Pr^{3+,3+}, use of Hartree Fock Slater wave functions to calculate Coulomb matrix elements in configuration interaction 241-7
- U³⁺, SCF wave functions including exchange effects 433-6
- recombination
- kinetic energy of ion pairs in 3-body ionic recombination 962-8
- Ar, three-body electron-ion recombination rate coefficient 522-7
- CO₂⁺, electron-ion recombination, measurement in flowing afterglow 1726-37
- N₂⁺, electron-ion recombination, measurement in flowing afterglow 1726-37
- NO⁺, electron-ion recombination, measurement in flowing afterglow 1726-37
- O₂⁺, electron-ion recombination, measurement in flowing afterglow 1726-37
- Iron
- atoms, soft X-ray spectra, classification 1747-68
 - Fe XI to XV, classification of emission lines from 3s²3pⁿ-3s3pⁿ⁺¹ and 3pⁿ-3pⁿ⁻¹3d transitions 1577-86
 - Fe XIII, XIV, XV, XVII ions, collision strengths for electron excitation 697-705
- Isotope shifts
- in electronic and muonic atoms, nuclear charge distribution determination 969-75
 - specific mass shift, contribution to optical isotope shift, alternative calculation method 288-95
 - Cd II, in resonance lines, size of specific mass shifts in alkali-like resonance lines 1798-1807
 - Nd, calculation of contribution of specific isotope shift to optical isotope shift 288-95
 - Sn IV, in resonance lines, size of specific mass shifts in alkali-like resonance lines 1798-1807
- Krypton
- transport coefficients, high temperature, calculation 621-7
- Kr-Ar mixture, thermal diffusion factor measurement 1548-63
- Lamb shift, *see Spectra/atoms*
- Lamps, *see Light sources*
- Laser transitions, *see Stimulated emission*
- Light sources
- W-halogen lamps, halogen separation, effects of convection and thermal diffusion 248-57
- Linewidths, *see Spectral line breadth*
- Lithium
- atoms, elastic electron scattering, modified Glauber approximation L39-41
 - atoms, low energy elastic electron scattering 1485-75
 - atom, UHF energy, third order, calculation using Hartree Fock equations 228-40
 - 4111, quantum defects L44-7
 - Li⁺, iterative perturbation solution of inverse potential problem 1140-9
- Luminescence, *see also Fluorescence; Stimulated emission*
- CdTi, CdTi₂, visible emission spectra, observation and vibrational analysis of red and blue systems 133-41
 - ZnTi, ZnTi₂, visible emission spectra, observation and vibrational analysis of red and blue systems 133-41
 - liquids and solutions
 - photoluminescence, quenching by electronic excitation transfer 609-20
- Magnesium
- atoms, transitions between levels of principle quantum numbers 3 and 4, line classification 1115-18
 - Mg⁺, spectral line broadening by electron impact, quantum mechanical calculation 1377-87
- Magnesium compounds
- MgO, new electronic state, evidence from emission spectrum 565-7
- Manganese
- atoms, soft X-ray spectra, classification 1747-68
 - Mn IX to XIV, classification of emission lines from 3s²3pⁿ-3s3pⁿ⁺¹ and 3pⁿ-3pⁿ⁻¹3d transitions 1577-86
- Many-body problems
- atomic spectra, photoabsorption, collective effects 1080-95
 - three body rearrangement collisions, convergence of the Faddeev-Watson multiple scattering expansion 191-207

Masers

- beam, multiple population inversion 1738-42
- cascaded cavity molecular beam, detuning phenomena, quantum mechanical analysis 1523-35

Mathematics

- hypervirial theorems from irreducible tensors 224-7

Mercury

- arc spectrum, autoionizing even levels 1236-42
- atoms, spectral emission from Hg-Ar discharge, influence of N_2 and CO impurities 1587-92
- molecular clusters, detection and ionization potential 528-30
- vapour, forward scattering of resonance radiation in magnetic field 1200-9
- Hg-Ar discharge, spectral emission, influence of N_2 and CO impurities 1587-92

Mercury compounds

- $HgCl_2$, ^{201}Cl n.q.r. frequency, temperature dependence 1393-4

Mesic atoms, *see* Atoms/mesic and muonicMicrowave spectra, *see* SpectraMicrowave spectrometers, *see* Spectrometers, radiofrequencyMolecular orbitals, *see* Molecules/electronic structure; Orbital calculation methodsMolecular spectra, *see* Spectra/inorganic molecules; Spectra/molecules; Spectra/organic moleculesMolecules, *see also* Polarizability; Spectra

- Coulomb Green function, equivalence of expressions L105-6
- Coulomb potential, screened, properties L107-8
- Coulomb T-matrix, on-shell L102-4
- diatomic, centrifugal distortion of spin orbit and spin rotation for doublet terms 1123-8
- diatomic, polar, multiplet states, theory of Stark effect 168-90
- harmonic oscillator, forced, correspondence principal methods L112-5
- Hg clusters, detection and ionization potential 528-30
- configurations and dimensions, inorganic optical second-harmonic generation from organic crystals, effect of molecular structure 116-23
- dissociation
 - H_3^+ , in H_2 gas at 410, 510 and 550 keV, atom yield measurement L88-91
 - HD^+ , electron impact dissociation,

asymmetry in angular distribution of fragments 1450-57

OD, high vibrational level predissociation on $A^2\Sigma^+$ state 124-32

OH predissociation reinterpreted 752-8

electronic structure

diatomic, spin-rotation interaction 20-7

doublet terms, diatomic molecules, centrifugal distortion of spin interaction 1123-8

electron repulsion integrals, four-centre evaluation between 1s Slater atomic orbitals 1514-21

multiplet states of diatomic polar molecules, theory of Stark effect 168-90

electronic structure, inorganic

electron-molecule resonant reactions, vibronic transitions 389-96

AsO^+ , AsO , potential energy curves for certain states, r -centroids, Franck Condon factors 269-78

CO, absolute absorption oscillator strength measurements on Cameron band 681-3

CO_2 electron-molecule resonant reactions, vibronic transitions 389-96

$N_2 W^3 \Delta_u$ state, processes giving rise to, 732-8

OD, high vibrational level predissociation on $A^2\Sigma^+$ state 124-32

electronic structure, organic

positrons, lifetimes measurement, study of annihilation 261-8

excitation

electron impact, polarization of molecular lines, united atom and Born approximation 1332-42

electron-molecule resonant reactions, vibronic transitions 389-96

lifetime, electron-photon coincidence measurement method 450-60

rotational state excitation in resonant reactions 911-17

CO, thermal electron scattering, close coupling calculations 494-502

CO_2 , electron-molecule resonant reactions, vibronic transitions 389-96

H_3^+ potential curves and symmetries of resonant states 368-88

MgO, new electronic state, evidence from emission spectrum 565-7

- N_2 , vibrational, by resonance scattering of electrons of 2-3 eV 53-70
 N_a^- , resonant state, electron impact studies 1055-62
 SnO , $D^{\infty}H-x^1\Sigma$ system, electronic transition moment variation 579-83
 intermolecular mechanics, *see also* *Collision processes/molecules*
 polarizable dipoles, anisotropic, exact interaction energy L81-3
 moments
 $H^{79}Br$, dipole moment function, from vibration-rotation band strengths 791-6
 rotation
 diatomic, centrifugal distortion of spin orbit and spin rotation for doublet terms 1123-8
 diatomic molecules, general form of second centrifugal correction of rotational terms 887-91
 diatomic molecules, rotational structure of $^4\Sigma$ states, general theory 1633-9
 diatomic, rotational structure of $^4\Sigma$ states, general theory 759-75
 rotational state excitation in resonant reactions 911-7
 spherical-top molecules, collision induced far i.r. rotation-translation spectrum, quantum theory 1661-9
 $H^{79}Br$, vibration-rotation band strengths, dipole moment function determination 791-6
 ScF , analysis of $B^{\infty}H-\Sigma^+$ system L11-13
 vibration
 electronic spectra, vibronic intensity distributions, moment analyses 584-92
 electron-molecule resonant reactions, vibronic transitions 389-96
 linear perturbation, due to long range polarization in highly excited and scattering electronic states, reduction factors for Franck Condon overlap 1076-9
 BaF , vibrational analysis of thermally excited emission spectrum 1395-7
 CO_2 electron-molecule resonant reactions, vibronic transitions 89-96
 $H^{79}Br$, vibration-rotation band strengths, dipole moment function determination 791-6
 H_a , $a^1\Sigma_g^+$ state, lifetime measurement 1063-9
 N_2 , $c^1\Pi_u$ state, lifetime measurement 1063-9
 SnO , $D^{\infty}H-x^1\Sigma$ system, effective vibrational temperature determination 579-83
 Muonic atoms, *see* *Atoms/mesic and muonic*
 Neodymium
 isotope shift, optical, contribution of specific mass shift 288-95
 Neon
 atom, binding energy, charge state dependence 14-19
 atom, correlation effects in X-rays and electronic intensities 1210-21
 atom polarizability tensor of metastable state 728-31
 atom, $2p^4 3p$ configuration, pressure broadening of Hanle effect 849-68
 atoms, alignment destroying collisions in $2p$ levels, theoretical cross sections 869-85
 atoms, elastic scattering, calculation in energy range 0 to 4 ryd 468-82
 atoms, slow electron scattering, phase shift analysis 1649-60
 inverse potential problem, iterative perturbation solution 1140-9
 transport coefficients, high temperature, calculation 621-7
 Ar-Ne mixture, thermal diffusion factor measurement 1548-63
 He*-Ne scattering, inelastic, quasi-diabatic representation 1040-54
 Ne*, collision with C foil, equilibrium charge distribution 1743-6
 Ne VII rate coefficients for singlet and triplet transitions 715-27
 Nickel
 atoms, soft X-ray spectra, classification
 Nitrogen
 atoms, elastic scattering, calculation in energy range 0 to 1 ryd 468-82
 ions, charge determination using Doppler shift technique L32-6
 molecule, $a^1\Sigma_g^+$ state, lifetime measurement 1063-9
 polarizability, calculation using Pople-Schofield approximation, extension to polarization potential calculation 461-7
 rotational state excitation in resonant reactions 911-17
 N V, ion, collision strengths for electron excitation 697-705
 N^+ , collision with C foil, equilibrium charge distributions 1743-6
 N^3+ , electron impact ionization cross section, production of N^0+ 1189-99
 N^3+ in collision with He, Ne, Ar, 1-3

- keV, electron capture probabilities
observations, curve crossing
diagnostics 343-64
- N_2^+ , resonant state, electron impact
studies 1055-62
- N_2 , vibrational excitation by resonance
scattering of electrons of 2-3 eV
53-70
- $\text{N}_2 \text{W}^3\Delta_u$ state, processes giving rise to,
732-8
- N_2^+ , electron-ion recombination,
measurement in flowing afterglow
1726-37
- $\text{N}_2\text{-Ar}^+$ charge exchange collision, rate
coefficient measurement 1711-25
- $\text{N}^+\text{-O}_2$ charge exchange collision, rate
coefficient measurement 1711-25
- Nitrogen compounds**
- NH_3 , microwave spectral lines,
measurement of widths and pressure
induced shifts 593-608
- NO , absolute absorption measurement
of $\text{B}(\text{B}^2\Pi\text{-X}^2\Pi)$ band system
1769-77
- NO^+ , electron-ion recombination
measurement in flowing afterglow
1726-37
- NO-Ar^+ charge exchange collision,
rate coefficient measurement
1711-25
- Nonlinear optics**
- organic molecular crystals, effect of
molecular structure on optical
second-harmonic generation 116-23
- Nuclear quadrupole resonance**
- HgCl_2 , ^{201}Cl n.q.r. frequency, tempera-
ture dependence 1393-4
- Nuclear structure**
- charge distribution determination from
isotope shifts of electronic and
muonic atoms 969-75
- Optics, nonlinear, see Nonlinear optics**
- Orbital calculation methods, see also
Hartree-Fock method**
- classical orbital integration cross-
section calculation for electron
ejection from He by proton
bombardment 706-14
- electron repulsion integrals, relationship
with spin-spin integrals 1102-8
- frozen core approximation,
multiconfiguration, small importance
of short range correlation 314-31
- Hartree-Fock equations, computer
programs for solution of relativistic
forms 631-42
- multiconfiguration energy bound
method for Feshbach type
autoionization states in He 32-41
- polarized orbital method for calculation
on electron scattering from atoms
658-69
- polarized orbital method, close coupling
method, modified 670-80
- SCF theory, constrained, for closed-
shell ground state 424-32
- spin-spin integrals, relationship with
electron repulsion integrals 1102-8
- H^- , frozen core approximation,
multiconfiguration, small importance
of short range correlation 314-31
- He, frozen core approximation,
multiconfiguration, small importance
of short range correlation 314-31
- Organic compounds**
- methyl cyanide, microwave spectral
lines, measurement of widths and
pressure induced shifts 593-608
- molecular crystals, effect of molecular
structure on optical second-harmonic
generation 116-23
- positrons, lifetimes measurement,
study of annihilation 261-8
- toluene solutions, fluorescence,
temperature dependence of singlet
excitation transfer and quenching
1516-22
- Oxygen**
- molecules, absolute measurement on
Heizberg I bands 1778-88
- molecules, absolute absorption
measurement in 2430 to 1920 Å
continuum 1789-97
- O^- , on Ne, Ar, Kr, Xe and N_2 , cross
sections for electron loss, 5-30 keV
111-15
- $\text{O} \text{V}$ states, radiative mean lives,
beam foil technique measurement
1070-5
- O^+ , collisions with C foil, equilibrium
charge distributions 1743-6
- O^+ , electron impact ionization cross
sections, production of O^{3+} 1176-88
- O^{3+} , electron impact ionization cross
sections, production of O^{3+} 1176-88
- O^{3+} in collision with He, Ne, Ar, 1-3
keV, electron capture probabilities
observations, curve crossing
diagnostics 343-64
- O_2^+ , electron-ion recombination,
measurement in flowing afterglow
1726-37
- $\text{O}_2\text{-Ar}^+$ charge exchange collision, rate
coefficient measurement 1711-25
- $\text{O}_2\text{-N}^+$ charge exchange collision, rate
coefficient measurement 1711-25

- O-O⁻, collisions, electron detachment cross section, formula derivation 219-22
- Oxygen compounds
- OCS, J 1-2 line, collision broadening by nonpolar perturbers 786-90
- OD, high vibrational level predissociation on A²E⁺ state 124-32
- OH predissociation reinterpreted 752-8
- Padé approximation, *see* Atoms/electron scattering
- Phosphors, *see* Luminescence
- Phosphorus
- atoms, elastic scattering, calculation in energy range 0 to 1 ryd 468-82
- P X isoelectronic emission lines 986-94
- Photoelectric effect, atomic, *see* Atoms
- Photoionization
- He metastable states, using e-He scattering equations 652-7
- Photoluminescence, *see* Luminescence
- Pinch effect, *see* Discharges, electric
- Plasma, *see also* Discharges, electric; Electrons; Ions
- satellite emission lines, apparent non observation in highly turbulent plasmas L7-10
- oscillations
- electron waves, optical generation L7b-80
- Plasma waves, *see* Plasma/oscillations
- Polarizability
- Ne, calculation using Pople-Schofield approximation, extension to polarization potential calculation 461-7
- Ne atom, polarizability tensor of metastable state 728-31
- Polarization
- electrons, low energy, in atomic scattering processes, general optical detector L91-4
- molecular lines, by electron impact, united atom and Born approximation 1332-42
- resonance radiation, excited state atoms, ensemble, relation between Sandle-Williams alignment tensor and density matrix 841-8
- light
- interactions represented by 4 × 4 transfer matrices, classification 940-53
- Population inversion, *see* Masers
- Positive column, *see* Discharges, electric
- Positrons, *see also* Electrons
- lifetime measurement in organic media, annihilation study 261-8
- Potassium
- atoms, ionization by 20 to 100 keV protons 1488-95
- atoms, selectively excited, stimulated Stokes and anti-Stokes electronic Raman scattering 1349-52
- spectral resonance broadening 741-7
- spectrum, low power discharges, explanation of observed diffuse bands 258-60
- K⁺, iterative perturbation solution of inverse potential problem 1140-9
- Praseodymium
- ions, 2⁺ and 3⁺, use of Hartree Fock Slater wave functions to calculate Coulomb matrix elements in configuration interaction 241-7
- Pr²⁺, Pr³⁺, configuration interaction, Trees parameters 1605-10
- Proton and antiproton scattering
- H atom, 1s-2s and 1s-2p excitation, Glauber approximation 836-40
- H atoms, coupled state calculation with nonlinear trajectories 1013-19
- Quantum electronics, *see* Masers
- Quantum generators, *see* Masers
- Quantum mechanics, *see* Quantum theory
- Quantum theory
- correspondence identity, charged particle motion in zero energy Coulomb field 143-52
- Coulomb Green function, equivalence of expressions L105-6
- Coulomb potential, screened, properties L107-8
- Coulomb T-matrix, on-shell L102-4
- harmonic oscillator, forced, correspondence principle methods L112-5
- potential scattering, calculation using apparently divergent Fredholm series, centrifugal barrier 1279-87
- scattering amplitude, determination by integral equation method 437-49
- spectral line broadening, by electron impact, quantum mechanical calculation 1377-87
- spherical-top molecules, collision induced far i.r. rotation-translation spectrum 1661-9
- two-level system assembly, angular momentum formalism 408-19
- application methods
- variational method for elastic scattering involving long range forces 443-51

- wave equations
 - H_2^+ wave functions 420-3
 - U^{++} , SCF wave functions including exchange effects 433-6
- Quenching, optical, *see Luminescence*
- Racah coefficients, *see Quantum theory*
- Radiative recombination, *see Luminescence*
- Raman spectra, *see Scattering/light, Raman spectra*
- Rare earth metals, *see also the individual metals*
 - ions, magnetic interactions, second order perturbation theory calculation 1388-92
 - X-ray spectra, observation high frequency satellite $L\beta_2$ observation 739-40
- Recombination radiation, *see Luminescence*
- Renner effect, *see Molecules*
- Resonance, nuclear quadrupole, *see Nuclear quadrupole resonance*
- Reviews
 - spectral line breadth in astrophysics 279-87
- RS coupling, *see Atoms; Spectra/atoms*
- Rubidium
 - atoms, selectively excited, stimulated Stokes and anti-Stokes electronic Raman scattering 1349-52
- Sandle-Williams alignment tensor, *see Atoms*
- Scandium compounds
 - SCF, rotational analysis of $B^1\Pi \rightarrow ^3\Sigma^+$ system L11-13
- Scattering
 - amplitude, determination by integral equation method 437-49
 - amplitude, large angle behaviour in narrow wave packet approximation 819-35
 - Faddeev-Watson multiple scattering expansion, convergence for 3 body rearrangement collisions 191-207
 - potential, calculation using apparently divergent Fredholm series, centrifugal barrier 1279-87
- light
 - Hg, vapour, forward scattering of resonance radiation in magnetic field 1200-9
- light, Raman spectra
 - K atoms, selectively excited, stimulated Stokes and anti-Stokes electronic Raman scattering 1349-52
 - Rb atoms, selectively excited, stimulated Stokes and anti-Stokes electronic Raman scattering 1349-52
- particles, *see also Collision processes*
 - charged particles, approximate evaluation of relativistic correction in potential scattering 995-7
- SCF procedure, *see Hartree-Fock method*
- Secondary electron emission, *see Electron emission, secondary*
- Silicon
 - atoms, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
 - Si VII to X isoelectronic emission lines 986-94
 - Si XII, ion, collision strengths for electron excitation 697-705
- Silver
 - X-ray spectra, quasistationary states and some L_2 satellites 1119-22
- Sodium
 - atom, electron impact excitation $3s \rightarrow 4s$, application of second Born approximation 690-6
 - atoms, low energy elastic electron scattering 1458-75
 - atoms, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
 - isoelectronic sequence, $4^2S \rightarrow 4^2P \rightarrow 4^2D$ transitions, absolute multiplet strengths 748-51
 - Na^+ , iterative perturbation solution of inverse potential problem 1140-9
- Sonoluminescence, *see Luminescence/liquids and solutions*
- Spectra, *see also Astronomical spectra; Scattering/light, Raman spectra; Spectroscopy; X-ray spectra*
 - line broadening, unified theories 1640-8
 - pressure broadening, unified classical path theories L99-101
 - atoms, *see also Auger effect; Atoms/excitation; Atoms/structure*
 - dressed atom, r.f. transitions 1008-12
 - emission lines resulting from $2s^2 2p^N - 2s 2p^{N+1}$ transitions in elements isoelectronic with Fe XVIII to Fe XXI, classification 981-5
 - isotope shift, optical, contribution of specific mass shift 288-95
 - photoabsorption, collective effects, many-body theory application 1080-95
 - rare earth ions, magnetic interactions, second order perturbation 1388-92
 - X-ray diagram lines, decisive criterion for determination of spin doublets 976-80

- X-ray spectra observation, high frequency satellite $L\beta_1$ observation 739-40
- Al, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
- Ar X to XV, new observations and isoelectronic emission lines 986-94
- Cd, generalized oscillator strength as function of electron bombardment 60-150 eV 684-9
- Cd II, isotope shifts in resonance lines, size of specific mass shifts in alkali-like resonance lines 1798-1807
- Cl II, Stark broadening measurement 1541-7
- Cl X to XIV spectral lines observation 986-94
- Co, soft X-ray spectra, classification 1747-68
- Cr, soft X-ray spectra, classification 1747-68
- Cr X to XII, classification of emission lines from $3s^2 3p^4$ - $3s 3p^5$ and $3p^4$ - $3p^3$ - $1d$ transitions 1577-86
- Cs, 4555 and 4593 Å lines, low pressure measurement of broadening and shift by He and Ar 555-64
- Cs, quadrupole transition probabilities $6S$ - nD , absorption measurements L20-3
- Cu, soft X-ray spectra, classification 1747-68
- F, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
- Fe, soft X-ray spectra, classification 1747-68
- Fe XI to XV, classification of emission lines from $3s^2 3p^4$ - $3s 3p^5$ and $3p^4$ - $3p^3$ - $1d$ transitions 1577-86
- Hg, arc spectrum, observation of emission lines broadened by autoionization 1236-42
- Hg, in Hg-Ar discharge, influence of N_2 and CO impurities 1587-92
- K, low power discharges, explanation of observed diffuse bands 258-60
- K, resonance broadening 741-7
- Mg, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
- Mn, soft X-ray spectra, classification 1747-68
- Mn IX to XIV, classification of emission lines from $3s^2 3p^4$ - $3s 3p^5$ and $3p^4$ - $3p^3$ - $1d$ transitions 1577-86
- Na sequence, 4^2S - 4^2P - 4^2D transitions, absolute multiplet strengths 748-51
- Na, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
- Nd, isotope shift, optical, contribution of specific mass shift 288-95
- Ne, $2p^6$ $3p$ configuration, pressure broadening of Hanle effect 849-68
- Ne VII rate coefficients for singlet and triplet transitions 715-27
- Ni, soft X-ray spectra, classification 1747-68
- O V states, radiative mean lives, beam foil technique measurement 1070-5
- P X, isoelectronic emission lines 986-94
- S IX to XII, isoelectronic emission lines 986-94
- Si, transitions between levels of principle quantum numbers 3 and 4, spectral line classification 1115-18
- Si VII to X, isoelectronic emission lines 986-94
- Sn IV, isotope shifts in resonance lines, size of specific mass shifts in alkali-like resonance lines 1798-1807
- V IX, X, classification of emission lines from $3s^2 3p^3$ - $3s 3p^4$ and $3p^3$ - $3p^2$ - $1d$ transitions 1577-86
- Sr, 44607 Å resonance line, collision broadening 568-73
- inorganic molecules, *see also* *Molecules*
- COS, microwave spectral lines, measurement of widths and pressure induced shifts 593-608
- AsO, potential energy curves for certain states, r-centroids, Franck Condon factors 269-78
- AsO*, potential energy curves for certain states, r-centroids, Franck Condon factors 269-78
- BaF, thermally excited emission spectrum 1395-7
- CO₂*, Fox-Duffendack-Barker and u.v. doublet band systems, Franck-Condon factors and related quantities 1096-101
- H₂, a $^2\Sigma^+$ state, lifetime measurement 1063-9
- H⁷⁹Br, vibration-rotation band strengths, dipole moment function determination 791-6
- MgO, emission spectrum evidence for new electronic state 565-7

- N_2 , $c^1\Pi_u$ state, lifetime measurement 1063-9
 NH_3 , microwave spectral lines, measurement of widths and pressure induced shifts 593-608
 NO , absolute absorption measurement of $B(B^2\Pi-X^2\Pi)$ band system 1769-77
 O_2 , absolute absorption measurement on Herzberg I bands 1778-88
 O_2 , absolute measurement in 2430 to 1920 Å continuum 1789-97
 OCS , J1-2 line, collision broadening by nonpolar perturbers 786-90
 OD , study of broadened linewidths of $B^2\Sigma^+-A^2\Sigma^+$ system 124-32
 SbF_5 , C_1 system ($\lambda 2600$ to $\lambda 2700$ Å), fine structure analysis 1398-402
 SnO , $D^2\Pi-x^2\Sigma$ system, electronic transition moment variation and determination of effective vibrational temperature 579-83
 SrI , visible emission spectrum, excitation and analysis 574-8
 TiD , rotational band structure 797-9
 TiH , rotational band structure 797-9
 molecules
 diatomic, rotational structure of 4 Σ states, general theory 759-75
 electronic, vibronic intensity distributions, moment analyses 584-92
 Franck Condon overlap, reduction factors related to linear perturbation to molecular vibrational states 1076-9
 line broadening, unified theories 1640-8
 line polarization, by electron impact, united atom and Born approximation 1332-42
 spherical-top molecules, collision induced far i.r. rotation-translation spectrum, quantum theory 1661-9
 organic molecules, *see also* *Molecules*
 methyl cyanide, microwave spectral lines, measurement of widths and pressure induced shifts 593-608
 Spectral line breadth, *see also* *Doppler effect*; *Stark effect*
 atoms, line broadening, unified theories 1640-8
 in astrophysics, review 279-87
 molecules, line broadening, unified theories 1640-8
 OCS , J1-2 line, collision broadening by nonpolar perturbers 786-90
 plasma polarization shifts, reduced limits on magnitude L94-7
 pressure broadening, unified classical path theories L99-101
 profile for combined Doppler and Lorentz broadening L36-8
 Stark broadening, unified classical path treatment 1230-5
 Ca^+ , electron impact broadening, quantum mechanical calculation 1377-87
 Ca , 4555 and 4593 Å lines, low pressure measurement of broadening and shift by He and Ar 555-64
 He, line broadening in plasma at high electron densities 1353-63
 He, line broadening in plasma at low electron densities 1364-76
 Hg, emission lines broadened by autoionization 1236-42
 K atom, resonance broadening 741-7
 Mg^+ , electron impact broadening, quantum mechanical calculation 1377-87
 Ne, $2p^3 3p$ configuration, pressure broadening of Hanle effect 849-68
 OD , broadened linewidths of $B^2\Sigma^+-A^2\Sigma^+$ system, spectral investigation 124-32
 Sr, $\lambda 4607$ Å resonance line, collision broadening 568-73
 Spectrometers, radiofrequency microwave, for line width and pressure induced shift measurement 593-608
 Spectroscopy, *see also* *Spectra*
 line profile for combined Doppler and Lorentz broadening, calculation L36-8
 Stark effect
 broadening, unified classical path treatment 1230-5
 multiplet states of diatomic polar molecules, theory 168-90
 Cl II spectra, measurement 1541-7
 Stars
 spectral line breadth factors, review 279-87
 Steel
 stainless, secondary electron emission, coefficient for metastable atoms, measurement by crossed beam method 1683-95
 stainless, secondary electron emission, coefficient for metastable atoms, measurement by gas cell method 1696-1710
 Stimulated emission, *see also* *Luminescence*; *Masers*
 multiphoton processes, thermodynamics mixed stimulated spontaneous effects L72-6

- two-level system assembly, angular momentum formalism 408-19
- K atoms, selectively excited, stimulated Stokes and anti-Stokes electronic Raman scattering 1349-52
- Rb atoms, selectively excited, stimulated Stokes and anti-Stokes electronic Raman scattering 1349-52
- Streamers, *see Discharges, electric*
- Strontium
 - atomic spectra, $\lambda 4607$ Å resonance line, collision broadening 568-73
- Strontium compounds
 - SrI, visible emission spectrum, excitation and analysis 574-8
- Sulphur
 - S IX to XII isoelectronic emission lines 986-94
- Sulphur compounds
 - SF₆, electron drift velocity measurement 1536-40
- Surveys, *see Reviews*
- Tensors
 - irreducible, determination of hypervirial theorems 244-7
 - irreducible, operator equivalents determination 28-31
- Thermodynamic properties
 - multiphoton processes, mixed stimulated spontaneous effects L72-6
- Thomas-Fermi method, *see Atoms/structure*
- Tin
 - Sn IV, isotope shifts in resonance lines, size of specific mass shifts in alkali-like resonance lines 1798-1807
- Tin compounds
 - SnO, D³Π- $\pi^3\Sigma$ system, electronic transition moment variation and determination of effective vibrational temperature 579-83
- Titanium compounds
 - TiD, molecular spectrum, rotational band structure 797-9
 - TiH, molecular spectrum, rotational band structure 797-9
- Transport processes
 - Ar, high temperature transport coefficients calculation 621-7
 - Kr, high temperature transport coefficients calculation 621-7
 - Ne, high temperature transport coefficients calculation 621-7
 - Xe, high temperature transport coefficients calculation 621-7
- Tungsten
 - electron emission, secondary, coefficient for metastable atoms, measurement by gas cell method 1696-1710
- W- halogen lamps, halogen separation, effects of convection and thermal diffusion 248-57
- Uranium
 - U⁴⁺, SCF wave functions including exchange effects 433-6
- Vanadium
 - V IX, X, classification of emission lines from $3s^2 3p^4-3s 3p^{4+1}$ and $3p^4-3p^3-3d$ transitions 1577-86
- Variational method, *see Quantum theory/application methods*
- Virial coefficients, *see Equations of state*
- Wave equations, *see Quantum theory/wave equations*
- Wave mechanics, *see Quantum theory*
- Wigner coefficients, *see Quantum theory*
- Wolfram, *see Tungsten*
- X-ray absorption spectra, *see X-ray spectra/absorption*
- X-ray emission spectra, *see X-ray spectra/emission*
- X-ray scattering, *see also Compton effect*
 - Ne correlation effects for X-ray intensities 1210-21
- X-ray spectra
 - rare earth metals, satellite β' , observation, high frequency 739-40
 - spin doublets, decisive criterion for determination 976-80
- absorption
 - Ag, quasi-stationary states and some α satellites 1119-22
- emission
 - Ar, charge state dependence, observation of line shifts 1-13
 - Co, soft X-ray spectra, classification 1747-68
 - Cr, soft X-ray spectra, classification 1747-68
 - Cu, soft X-ray spectra, classification 1747-68
 - Fe, soft X-ray spectra, classification 1747-68
 - Mn, soft X-ray spectra, classification 1747-68
 - Ne, photon, energy dependence on degree of ionization investigation 14-19
 - Ni, soft X-ray spectra, classification 1747-68
- Xenon
 - transport coefficients, high temperature, calculation 621-7
- Zinc compounds
 - ZnII, ZnII₂, visible emission spectra, observation and vibrational analysis of red and blue systems 133-41

Author index with titles

- Abraham K.C. and Patel M.M.: Fine structure analysis of the C₁ system (λ2600-λ2700 Å) of the SbF molecule P1398
- Aitken K.L. and Harrison M.F.A.: Measurements of the cross sections for electron impact ionization of multi-electron ions I. O⁺ to O³⁺ and O²⁺ to O³⁺ P1176
- Aitken K.L., Harrison M.F.A. and Rundel R.D.: Measurements of the cross section for electron impact ionization of multi-electron ions II. N²⁺ to N³⁺ and C⁺ to C²⁺ P1189
- Ali M.A.: Absolute multiplet strength of 4²S → 4²P → 4²D transitions of sodium sequence P748
- Allegrini M. and Arimondo E.: Radio-frequency transitions in a dressed atom P1008
- Anderson V.E. with Christophorou L.G. and McCorkle D.L.: Swarm-determined electron attachment cross sections as a function of electron energy P1163
- Andrick D. and Read F.H.: Angular distribution for the excitation of vibronic states by resonant electron molecule reactions P389
- Andrick D. with Read F.H.: Angular distributions for the excitation of rotational states by resonant electron molecule reactions P911
- Arimondo E. with Allegrini M.: Radio-frequency transitions in a dressed atom P1008
- Bagus P.S., Hibbert A. and Moser C.: Multiconfiguration Hartree-Fock calculations of the 2p³ and 2p⁴ isoelectronic series P1611
- Balajua K.L. with Shelton W.N. and Watson C.E.: Elastic exchange scattering of electrons on the hydrogen atom in the distorted wave approximation P71
- Baltayan P. and Nédélec O.: Polarization of molecular lines by electron impact. United atom and Born approximation P1332
- Banerjee S.N. with Banerji G. and Sil N.C.: Binding energy of helium atom by Faddeev formalism L5
- Banerji G., Banerjee S.N. and Sil N.C.: Binding energy of helium atom by Faddeev formalism L5
- Banks D. with Bonsen T.F.M.: Angular distribution of electrons ejected by charged particles: III. Classical treatment of forward ejection P706
- Bardo W.S. and Laine D.C.: On detuning phenomena in cascaded cavity molecular beam masers P1523
- Bardo W.S. with Laine D.C.: Multiple population inversion in a beam maser P1738
- Barnes K.S.: Quantum mechanical calculations of the electron impact broadening of isolated ion lines P1377
- Barrow R.F. and Pedersen L.: Rotational analysis of the system n²Π - ²Σ⁺ of gaseous ScF L11
- Barua A.K., Saha S. and Mullick K.: On the angular distribution of the fragments produced from the collisions induced dissociation of HD⁺ ion P1450
- Bashkin S., Cariveau G.W. and Hay H.J.: Charge identification for spectral lines in nitrogen L32
- Bates D.R., Hayes P.B. and Sprevak D.: Kinetic energy of ion pairs in three-body ionic recombination P962
- Bates D.R. and Sprevak D.: Translation factor in basis functions used in perturbed stationary state approximation and capture in H⁺-H(1s) collisions L47
- Beatty E.C. with Peterson W.K. and Opal C.B.: Energy distributions of electrons ejected in ionizing collisions of electrons with helium P1020
- Beauchemin G. with Girardeau R., Knystautas E.J., Neveu B. and Drouin R.: Equilibrium charge distributions of C, N, O, and Ne in carbon foil P1743
- Bell K.L. and Kingston A.E.: Electron loss from fast metastable hydrogen atoms passing through atomic hydrogen and helium P162
- Bell K.L. and Kingston A.E.: Photoionization cross sections for the helium isoelectronic series P1308
- Bely O., Schwartz S.B. and Val J.L.: Autoionization structure in the ionization of Ba⁺ by electron impact P1482

- Benesch R: Algebraic determination of electron-nuclear and electron-electron distribution function from Hylleraas type wavefunctions P1403
- Benesch W.M. and Saum K.A.: The $w^3\Delta_u$ state of molecular nitrogen P732
- Betz H.D. with Wirtkower A.B.: Charge changing cross sections for heavy ions in complex molecules: the failure of an 'additive' rule P1173
- Beyer J. and Kleinpöppen H.: Fine structure measurements in He^+ , $n = 4$. I. Intervals S-F L129
- Birkinshaw K. and Hasted J.B.: Inelastic collisions between atomic ions and diatomic molecules P1711
- Birks J.B., Najjar H.Y. and Lumb M.D.: Energy transfer in organic systems XI. Temperature dependence of singlet excitation transfer and quenching in toluene solutions P1516
- Birtwistle D.T. and Herzenberg A.: Vibrational excitation of N_2 by resonance scattering of electrons P53
- Bishop D.C. and King W.H.: Isotope shifts in the resonance lines of CdII and SnIV and the size of specific mass shifts in alkali like resonance lines P1798
- Bjorn N.: Constrained SCF theory for a closed-shell ground state P424
- Bonsen T.F.M. and Banks D.: Angular distribution of electrons ejected by charged particles: III. Classical treatment of forward ejection P706
- Bottcher C.: An iterative perturbation solution of the inverse potential problem P1140
- Bottcher C.: Unified classical path theories of pressure broadening L99
- Boyle L.L. and Crawford Jones L.: Determination of operator equivalents from irreducible tensors P28
- Boyle L.L. and Crawford Jones L.: Determination of hypervirial theorems from irreducible tensors P224
- Bradley D.J., Gale G.M. and Smith P.D.: Stimulated Stokes and anti-Stokes electronic Raman scattering by selectively excited potassium and rubidium atom P1349
- Brennan H.M. and Morrow R.: Proton-hydrogen atom momentum transfer cross section at ~ 5 eV L53
- Brissaud A. with Frisch U.: On the validity of the unified classical path treatment of Stark broadening P1230
- Brown F.C. with Hayes W.: Absorption of BF_3 gas in the extreme ultraviolet L85
- Browning R. with Gilbody H.B., Dunn K.F. and Latimer C.J.: Formation of metastable helium atoms by electron capture during the passage of fast He^+ ions through gases P800
- Browning R. with Gilbody H.B., Reynolds R.M. and Riddell G.I.: Collisional destruction of fast metastable hydrogen atoms P94
- Browning R. with Simpson F.R. and Gilbody H.B.: An experimental study of the decay of the He^- ion P106
- Burgess D.D.: An explanation of the apparent non-observation of 'near' plasma satellite emission lines in highly turbulent plasmas L7
- Burgess D.D. and Cairns C.J.: Experimental studies of helium broadening in a plasma: II. low electron densities (lines with forbidden components) P1364
- Burgess D.D. with Jenkins J.E.: Experimental studies of helium line broadening in a plasma: I. High electron densities P1353
- Burgess D.D. and Peacock N.J.: Reduced limits on the magnitude of possible plasma polarization shifts L94
- Burgess D.D., Richards A.G. and Mahon R.: A new technique for the optical generation of electron plasma waves L76
- Burke P.G., Hibbert A. and Robb W.D.: Electron scattering by complex atoms P153
- Byrne J.: A classification of electron and optical polarization transfer matrices P940
- Byrne J. and Farago P.S.: Faraday rotation of electron spin polarization P954
- Cairns C.J. with Burgess D.D.: Experimental studies of helium broadening in a plasma: II. Low electron densities (lines with forbidden components) P1364
- Calvert J.McI. and Davison W.D.: The multi-configuration frozen core approximation: I. Eigenstates of the two-electron atoms P314
- Cameron S. with Cohen M., McEachran R.P. and Stauffer J.A.: Lower bounds to energy levels of two-electron atoms P1109
- Carrington C.G.: On the classical model for resonance fluorescence P1222
- Carrington C.G. and Corney A.: Pressure broadening of the Hanle effect in a neon discharge P849

- Carrington C.G. and Corney A.: Theoretical cross sections for alignment destroying collisions in the 2p levels of neon P869
- Carrière G.W. with Baahlin S. and Hay H.J.: Charge identification for spectral lines in nitrogen L32
- Ceyzeriat P. with Druetta M. and Poulicac M.C.: Radiative mean lives of oxygen V states P1070
- Chalmers A.G. and Pillow M.E.: The influence of N_2 and CO impurities on the spectral emission from a mercury-argon discharge P1587
- Chatterjee G. and McDowell M.R.C.: Electron capture by fast protons in He and H_2 P896
- Chen A.C. and Chen J.C.Y.: A note on the Coulomb Green's Function L102
- Chen Y.C.Y. with Chen A.C.: A note on the Coulomb Green's Function L102
- Chen J.C.Y. and Hambro L.: Multiple scattering expansions of nonrelativistic three-body collision problems: II. Convergence of the Faddeev-Watson expansion for rearrangement collisions P191
- Chraplyvy Z.V.: Approximate evaluation of the relativistic correction in potential scattering of charged particles P995
- Christophorou L.G., McCorkle D.L. and Anderson V.E.: Swarm-determined electron attachment cross sections as a function of electron energy P1163
- Clark A.P. and Dickinson A.S.: Correspondence principle method applied to a forced harmonic oscillator L112
- Clout P.N. and Heddle D.W.O.: Electron impact excitation of argon II lines P483
- Coaton J.R. and Phillips N.J.: The influence of convection and thermal diffusion on halogen separation in vertical burning linear tungsten-halogen lamps P248
- Čobić B. with Matić M.: Electron loss by C^- and O^- ions in gaseous targets P111
- Čobić B. with Vujović M., Matić M. and Gordeev Yu.S.: Analysis of metastable state population in fast ion beams L18
- Cohen M., McEachran R.P., Cameron S. and Stauffer J.A.: Lower bounds to energy levels of two-electron atoms P1109
- Corney J. and Read F.H.: Potential curves and symmetries of some resonant states of H_2^- P368
- Corney J. and Read F.H.: Electron impact studies of a resonant state of N_2^- P1055
- Corney J. and Read F.H.: Resonance scattering of electrons from CO P1678
- Copland G.M., Newman D.J. and Taylor C.D.: Configuration interaction in rare earth ions: II. Magnetic interactions P1388
- Copland G.M., Taylor C.D. and Newman D.J.: Configuration interaction in rare earth ions: III. Trees parameters for Pr^{2+} and Pr^{3+} P1605
- Corney A. with Carrington C.G.: Pressure broadening of the Hanle effect in a neon discharge P849
- Corney A. with Carrington C.G.: Theoretical cross sections for alignment destroying collisions in the 2p levels of neon P869
- Cornille M. with Naon M.: Correlation effects in x rays and electronic intensities for the neon atom P1210
- Cornille M. with Naon M. and Roux M.: Compton profiles for the first and second row atoms P1593
- Corrigall B. and Wallace R.: Coupled state calculations of proton-hydrogen atom scattering with nonlinear trajectories P1013
- Crawford O.H. and Dalgarno A.: The scattering of thermal electrons by carbon monoxide P494
- Crawford Jones L. with Boyle L.L.: Determination of operator equivalents from irreducible tensors P28
- Crawford Jones L. with Boyle L.L.: Determination of hyperviral theorems from irreducible tensors P224
- Czarny J., Felenbok P. and Lefebvre-Brion H.: High vibrational level predissociation in the $A^2\Sigma^+$ state of OD P124
- Dalgarno A. with Crawford O.H.: The scattering of thermal electrons by carbon monoxide P494
- Davison W.D. with Calvert J.McI.: The multi-configuration frozen core approximation: I. Eigenstates of the two-electron atoms P314
- Deodhar G.B. and Rai S.: Decisive criterion for determination of spin doublets in x-ray diagram lines P976
- Deodhar G.B. and Rai S.: Quasi-stationary states and some L_{α} satellites of metallic silver P1119
- Desclaux J.P., Mayers D.F. and O'Brien F.: Relativistic atomic wave functions P631
- Desclaux J.P., Moser C.M. and Verhaegen G.: Relativistic energies of excited states of atoms and ions of the second period P296

- Dickinson A.S.: Some properties of the screened Coulomb potential L116
- Dickinson A.S. with Clark A.P.: Correspondence principle method applied to a forced harmonic oscillator L112
- Dmitriev I.S. with Teplova Ya.A. and Nikolaev V.S.: On electron loss and capture cross sections for multiply charged ions in solid matter L70
- Dolder K.T. with Peart B.: Collisions between electrons and H_2^+ ions: I. Measurements of cross section for proton production P1496
- Dolder K.T. with Peart B. and Walton D.S.: The formation of H^+ from H^- ions by electron impact P88
- Dolder K.T. with Walton D.S. and Peart B.: A measurement of cross sections for detachment from H^- by a method employing inclined ion electron beams P1343
- Dose V. and Hett W.: Collisional quenching of metastable deuterium L83
- Drouin R. with Girardeau R., Knystautas E.J., Beauchemin G. and Neveu B.: Equilibrium charge distributions of C, N, O, and Ne in carbon foil P1743
- Druetta M., Poullizac M.C. and Ceyzeriat P.: Radiative mean lives of oxygen V states P1070
- Dube P.S. and Rai D.K.: Electronic transition moment variation in $d^1\Pi-x^1\Sigma$ system of SnO molecule and determination of the effective vibrational temperature P579
- Dunn K.F. with Gilbody H.B., Browning R. and Latimer C.J.: Formation of metastable helium atoms by electron capture during the passage of fast He^+ ions through gases P800
- Dunning F.B. and Smith A.C.H.: Secondary electron ejection from metal surfaces by metastable atoms: II. Measurements of secondary emission coefficients using a gas cell method P1696
- Dunning F.B., Smith A.C.H. and Stebbings R.F.: Secondary electron ejection from metal surfaces by metastable atoms: I. Measurements of secondary emission coefficients using a crossed beam method P1683
- Durrant A.V. with Landheer B.: Calculation of spectral line profiles for combined Doppler and Lorentz broadening L36
- Durrant A.V. and Landheer B.: Forward scattering of resonance radiation by mercury vapour in a magnetic field P1200
- Dutton J. and Powell J.M.: The influence of Penning ionization on the experimental determination of ionization coefficients in helium at low values of E/N P1506
- Dymond J.H.: High temperature transport coefficients for the rare gases neon to xenon P621
- Eliezer I. with Wilson R.G.: The third-order Hartree-Fock energy for the $1s2s^1S$ states of helium-like ions P1255
- Farago P.S. with Byrne J.: Faraday rotation of electron spin polarization P954
- Farr J.M. and Hindmarsh W.R.: Collision broadening in the strontium resonance lines, $\lambda 4607 \text{ \AA}$ P568
- Fawcett B.C.: Classification in the period between calcium and iron of emission lines isoelectronic with those of carbon, nitrogen, oxygen and fluorine P981
- Fawcett B.C.: Spectral line classification in the period between fluorine and silicon, of transitions between levels of principal quantum numbers 3 and 4 P1115
- Fawcett B.C.: Classification of Fe XI to XV emission lines from $3s^2p^4-3s3p^4$ and $3p^4-3p^4-3d$ transitions and isoelectronic spectra in manganese, chromium and vanadium P1577
- Fawcett B.C., Gabriel A.E. and Paget T.M.: New observations of the spectra of argon X to XV and of isoelectronic emission lines in silicon VII to X, phosphorus X, sulphur IX to XII and chlorine X to XIV P986
- Feautrier N., Regemorter H. Van. and Vo Ky Lan: The method of polarized orbitals: II. The close coupling method using a polarized orbital expansion P670
- Felenbok P. with Czarny J. and Lefebvre-Brion H.: High vibrational level predissociation in the $A^2\Sigma^+$ state of OD P124
- Flannery M.R.: The binary encounter theory for a general interaction P892
- Flower D.R.: Collision strengths for electron excitation of highly ionized, complex atoms P697
- Frisch U. and Brissaud A.: On the validity of the unified classical path treatment of Stark broadening P1230

- Gabriel A.E. with Fawcett B.C. and Paget T.M.: New observations of spectra of argon X to XV and of isoelectronic emission lines in silicon VII to X, phosphorus X, sulphur IX to XII and chlorine X to XIV P986
- Gale G.M. with Bradley D.J. and Smith P.D.: Stimulated Stokes and anti-Stokes electronic Raman scattering by selectively excited potassium and rubidium atoms P1349
- Garg K.B., Kapoor Q.S. and Nigam A.N.: Satellite $L\beta_3$ in x-ray spectra of rare earths P739
- Garibotti C.R. and Massaro P.A.: Approximation methods in the scattering of fast electrons and positrons by hydrogen atoms P79
- Garibotti C.R. and Massaro P.A.: A variational approach to the scattering of fast electrons by hydrogen and helium atoms P1270
- Garrett W.R.: Variational method for elastic scattering involving long range forces P643
- Gaussorgues C. and Salin A.: Differential and total cross sections for excitation of the $n = 2$ level of hydrogen by proton impact P503
- Gaydon A.G. and Kopp I.: Predissociation in the spectrum of OH; a re-interpretation P752
- Gaydon A.G. with Smith R.E.: The spectrum of titanium hydride, TiH and TiD P797
- Geltman S.: A high energy approximation: I. Proton-hydrogen charge transfer P1288
- Geltman S. and Hidalgo M.B.: A high energy approximation: II. Hydrogen atom excitation by electrons P1299
- Gerjuoy E. with Sheorey V.B. and Thomas B.K.: Comparisons of the Glauber and Vainshtein approximations for inelastic electron-hydrogen scattering L57
- Ghosh A.S. and Sil N.C.: Inelastic proton-hydrogen scattering by Glauber approximation P836
- Gilbody H.B., Browning R., Reynolds R.M. and Riddell G.I.: Collisional destruction of fast metastable hydrogen atoms P94
- Gilbody H.B., Dunn K.F., Browning R. and Latimer C.J.: Formation of metastable helium atoms by electron capture during the passage of fast He^+ ions through gases P800
- Gilbody H.B. with McCullough R.W.: Ionization of potassium by 20–100 keV protons P1488
- Gilbody H.B. with Simpson F.R. and Browning R.: An experimental study of the decay of the He^+ ion P106
- Girardeau R., Knystaustas E.J., Beauchemin G., Neveu B. and Drouin R.: Equilibrium charge distributions of C, N, O, and Ne in carbon foil P1743
- Gordeev, Yu. S. with Vujović M., Matić M. and Cobić B.: Analysis of metastable state population in fast ion beams L18
- Gott, J.R.: Effect of molecular structure on optical second-harmonic generation from organic crystals P116
- Gray C.G.: Theory of collision-induced absorption for spherical top molecules P1661
- Grew K.E. and Wakeham W.A.: A redetermination of the thermal diffusion factor for some inert gas mixtures: I P1548
- Gunn H.I. and Sandle W.J.: A method for the direct determination of the decay rate γ for the population of an excited atomic state L1
- Hall R.I. with Reinhardt J., Joyez G. and Mazeau J.: Resonance phenomena in the low energy electron impact excitation of helium by trapped electron method L61
- Hambro L. with Chen J.C.Y.: Multiple scattering expansions for nonrelativistic three-body collision problems: II. Convergence of the Faddeev-Watson expansion for rearrangement collisions P191
- Hameed S.: Polarizability tensors of metastable $^3\text{P}_2$ neon P728
- Harbour P.J.: The detection and ionization potential of mercury clusters P528
- Harris F.M. and Jones G.J.: Drift velocities of electrons in sulphur hexafluoride P1536
- Harrison M.F.A. with Aitken K.L.: Measurements of the cross section for electron impact ionization of multi-electron ions: I. O^+ to O^{2+} and O^{2+} to O^{3+} P1176
- Harrison M.F.A. with Aitken K.L. and Rundel R.D.: Measurements of the cross section for electron impact ionization of multi-electron ions: II. N^{2+} to N^{3+} and C^+ to C^{2+} P1189

- Hasson V. and Nicholls R.W: Absolute absorption oscillator strength measurements of the ($a^1\Pi-x^1\Sigma$) Cameron band system of CO P681
- Hasson V. and Nicholls R.W: Absolute spectral absorption measurements of the NO- β ($s^1\Pi-x^1\Pi$) band system of nitric oxide P1769
- Hasson V. and Nicholls R.W: Absolute spectral absorption measurements on molecular oxygen from 2640-1920Å: I. Herzberg I ($\Lambda^1\Sigma^+-x^1\Sigma^+$) bands (2640-2430 Å) P1778
- Hasson V. and Nicholls R.W: Absolute spectral absorption measurements on molecular oxygen from 2640-1920 Å: II. Continuum measurements 2430-1920 Å P1789
- Hasted J.B. with Birkinshaw K: Inelastic collisions between atomic ions and diatomic molecules P1711
- Hasted J.B, Iqbal S.M. and Yousaf M.M: Curve-crossing in single electron capture collisions P343
- Hasted J.B. with Mahdavi M.R. and Nakahbandi M.M: Electron-ion recombination measurements in the flowing afterglow P1726
- Hay H.J. with Bashkin S. and Cariveau, G.W: Charge identification for spectral lines in nitrogen L32
- Hayes P.B. with Bates D.R. and Sprevak D: Kinetic energy of ion pairs in three-body ionic recombination P962
- Hayes W. and Brown F.C: Absorption of BF₃ gas in the extreme ultraviolet L85
- Heaton M. and Moiseiwitsch B.L: Virial theorem for variational functions in collision theory P332
- Heddle D.W.O. with Clout P.N: Electron impact excitation of argon II lines P483
- Hertel I.V. and Rost K.A: Application of the second Born approximation to the 3s-4s excitation of sodium by electron impact P690
- Herzenberg A. with Birtwistle D.T: Vibrational excitation of N₂ by resonance scattering of electrons P53
- Hett W. with Dose V: Collisional quenching of metastable deuterium L83
- Hibbert A. with Bagus P.S. and Moser C: Multiconfiguration Hartree-Fock calculations of the 2p³ and 2p⁴ isoelectronic series P1611
- Hibbert A. with Burke P.G. and Robb W.D: Electron scattering by complex atoms P153
- Hidalgo M.B. with Geltman S: A high energy approximation. II. Hydrogen atom excitation by electrons P1299
- Hindmarsh W.R. with Farr, J.M: Collision broadening in the strontium resonance line, $\lambda 4607 \text{ Å}$ P568
- Holstien E. and Midtdal J: Tests of the multiconfiguration energy-bound method for Feabach-type autoionization states of two-electron atoms: II. Application to He states between higher thresholds P32
- Holstien E. and Midtdal J: Variational nonrelativistic calculations for the (2pnp)^{1,3}P^o states of two-electron atomic systems P1243
- Holt A.R, Hunt, J. and Moiseiwitsch B.L: Forward elastic scattering of electrons by helium L41
- Holt A.R, Hunt J. and Moiseiwitsch B.L: Application of a simplified second Born approximation to the scattering of electrons and protons by helium atoms P1318
- Hunt J. with Holt A.R. and Moiseiwitsch B.L: Forward elastic scattering of electrons by helium L41
- Hunt J. with Holt A.R. and Moiseiwitsch B.L: Application of a simplified second Born approximation to the scattering of electrons and protons by helium atoms P1318
- Imhof R.E. and Read F.H: A new electron-photon coincidence method for the measurement of lifetimes in atoms and molecules P450
- Imhof R.E. and Read F.H: Measured lifetimes of the c ¹Π_u state of N₂ and the a ³Σ_g⁺ state of H₂ P1063
- Iqbal S.M. with Hasted J.B. and Yousaf M.M: Curve-crossing in single electron capture collisions P343
- Janev R.K: Atom-excited atom exchange interaction at large distances P215
- Janev R. K. and Salin A: Charge-exchange in hydrogen atom collisions L127
- Janev R.K. and Tancic A.R: Electron detachment in H-H⁺ and O-O⁺ collisions P219
- Jeannot J.C. with Sayer B, Wang R. and Sassi M: Absorption measurements of quadrupole transition probabilities 6S- n D in caesium vapour L20

- Jenkins J.E. and Burgess D.D.: Experimental studies of helium line broadening in a plasma: I. High electron densities P1353
- Jones G.J. with Harris F.M.: Drift velocities of electrons in sulphur hexafluoride P1536
- Jones M.: Mutual spin-orbit and spin-spin interactions in atomic calculations P1422
- Josh S.K. with Mathur K.C. and Tripathi: Elastic scattering of electrons by lithium atoms using modified Glauber approximation L39
- Joyes P.: On a mechanism of secondary emission of polyatomic particles L15
- Joyez G. with Reinhardt J, Hall R.I. and Mazeau J.: Resonance phenomena in the low energy electron impact excitation of helium by trapped electron method L61
- Kaminski J. with Kawaki A. and Kuten E.: Quenching of photoluminescence of solutions by electronic excitation transfer P609
- Kapoor Q.S. with Garg K.B. and Nigam, A.N.: Satellite $L\beta_2$ in x-ray spectra of rare earths P739
- Karule E.: On the evaluation of transition matrix elements for multiphoton processes in atomic hydrogen L67
- Kastner S. with Swartz M, Rothe E. and Neupert W.: Soft x-ray spectra of Cr, Mn, Fe, Co, Ni, Cu; classifications in NeI, FI, OF, NI, and CI isoelectronic sequences P1747
- Kawaki A, Kaminski J. and Kuten E.: Quenching of photoluminescence of solutions by electronic excitation transfer P609
- Kennedy W.L.: The relation between the Sandle-Williams alignment tensor and the density matrix for an ensemble of excited state atoms P841
- Khare P.L. with Tankhiwale A.V. and Mande, C.: Application of the Z effective values of hydrogenic wavefunctions in the calculation of the K-L Auger energies P1250
- Khare S.P. and Shobha P.: Differential cross sections for the elastic scattering of electrons by helium atoms P208
- King W.H.: The estimation of mass shifts in optical isotope shifts P288
- King W.H. with Bishop D.C.: Isotope shifts in the resonance lines of Cd II and SnIV and the size of specific mass shifts in alkali like resonance lines P1798
- Kingston A.E. with Bell K.L.: Electron loss from fast metastable hydrogen atoms passing through atomic hydrogen and helium P162
- Kingston A.E. with Bell K.L.: Photoionization cross sections for the helium isoelectronic series P1308
- Kirby K.K. with Pandey P.C. and Srivastava S.L.: Collision broadening of the OCS J1-2 line by non-polar perturbers P786
- Kleinpoppen H. with Beyer J.: Fine structure measurements in He^+ , $n = 4$. I. Intervals S-F L129
- Knyštautas E.J. with Girardeau R, Beauchemin G. sj, Neveu B. and Drouin R.: Equilibrium charge distributions of C, N, O, and Ne in carbon foil P1743
- Konjevic N, Platina M. and Puric J.: Electron impact broadening of ionized chlorine lines P1541
- Kopp I. with Gaydon A.G.: Predissociation in the spectrum of OH; a reinterpretation P752
- Korwar V.M. with Kovacs I.: General theory of the rotational structure of 4Σ states of diatomic molecules I P759
- Kovács I. and Korwar V.M.: General theory of the rotational structure of 4Σ states of diatomic molecules I P759
- Kovács I. and Pacher P.: General theory of the rotational structure of 4Σ states of diatomic molecules: II P1633
- Kovács I. and Vujisic B.: Centrifugal distortion of the spin-orbit and spin-rotation interaction for doublet terms P1123
- Kuten E. with Kawaki A. and Kaminski J.: Quenching of photoluminescence of solutions by electronic excitation transfer P609
- Laine D.C. with Bardo W.S.: On detuning phenomena in cascaded cavity molecular beam masers P1523
- Laine D.C. and Bardo W.S.: Multiple population inversion in a beam maser P1738
- Lakshman S.V.J. and Ramakrishna Rao T.V.: RKR curves, r -centroids and

- Franck Condon factors for certain bands of AsO and AsO^+ molecules P269
- Landheer B. and Durrant A.V.: Calculation of spectral line profiles for combined Doppler and Lorentz broadening L36
- Landheer B. with Durrant A.V.: Forward scattering of resonance radiation by mercury vapour in a magnetic field P1200
- Larkins F.P.: Dependence of fluorescence yield on atomic configuration L29
- Larkins F.P.: Charge state dependence of x-ray and Auger electron emission spectra for rare-gas atoms: I. The argon atom P1
- Larkins, F.P.: Charge state dependence of x-ray and Auger electron emission spectra for rare-gas atoms: II. The neon atom P14
- Latimer C.J. with Gilbody H.B., Dunn K.F. and Browning R.: Formation of metastable helium atoms by electron capture during the passage of fast He^+ ions through gases P800
- Learner R.C.M. and Morris J.: Autoionizing even levels in the mercury arc spectrum P1236
- Lebedeff S.A.: On a relation between unitary transformations in the impact parameter approximation which describes the behaviour of the electrons before and after the trajectory crosses the turning point P42
- Lebedeff S.A.: Large angle behaviour of the scattering amplitude in the narrow wave packet approximation P819
- Lee R.: The unified theories of line broadening P1640
- Lefebvre-Brion H. with Czarny J. and Felenbok P.: High vibrational level predissociation in the $\Lambda^2\Sigma^+$ state of OD P124
- Lefebvre-Brion H. with Sidis V.: A 'quasi-diabatic' representation for inelastic collisions. Application to the scattering of He^+ by Ne P1040
- Lemaire J.L. with Rostas F.: Low pressure measurements of the broadening and shift of the caesium 4555 Å and 4593 Å lines by helium and argon P555
- Levy-Leblond J.M.: Nonexistence of the ion H^{--} L23
- Lewis E.L., Rebbeck M.M. and Vaughan J.M.: Resonance broadening in the spectra of potassium P741
- Lumb M.D. with Birks J.B. and Najjar H.Y.: Energy transfer in organic systems: XI. Temperature dependence of singlet excitation transfer and quenching in toluene solutions P1516
- McCallum J.C. and Nicholls R.W.: Franck-Condon factors and related quantities for the Fox-Duffendack-Baker ($\Lambda^2\Pi_g-x^2\Pi_g$) and ultraviolet doublet ($\Lambda^2\Sigma_g-x^2\Pi_g$) band systems of Co_2^+ P1096
- McCarroll R. and Piacentini R.D.: Rotational coupling effects on the differential elastic and inelastic sections in He^+-He collisions P1026
- McCorkle D.L. with Christophorou L.G. and Anderson V.E.: Swarm-determined electron attachment cross sections as a function of electron energy P1163
- McCullough R.W. and Gilbody H.B.: Ionization of potassium by 20-100 keV protons P1488
- McDowell M.R.C.: A phase shift analysis of electron-atom scattering: IV. scattering of slow electrons by neon and argon P1649
- McDowell M.R.C. with Chatterjee G.: Electron capture by fast protons in He and H_2 P896
- McDowell M.R.C. and Richards D.: The on-shell coulomb T matrix L105
- McEachran R.P. with Cohen M., Cameron S. and Stauffer J.A.: Lower bounds to energy levels of two-electron atoms P1109
- McWhirter R.W.P. with Tondello G.: Measurements of excitation rate coefficients for singlet and triplet transitions of neon VII P715
- Magnasco V. with Musso G.F.: Evaluation of four-centre molecular integrals P1415
- Mahdavi M.R., Hasted J.B. and Nakshbandi M.M.: Electron-ion recombination measurements in the flowing afterglow P1726
- Mahon R. with Burgess D.D. and Richards A.G.: A new technique for the optical generation of electron plasma waves L76
- Mande C. with Tankhiwale A.V. and Khare P.L.: Application of the Z effective values of hydrogenic wavefunctions in the calculation of the K-LL Auger energies P1250
- Massaro P.A. with Garibotti C.R.: Approximation methods in the scattering of fast electrons and positrons by hydrogen atoms P79

- Massaro P.A. with Garibotti C.R.: A variational approach to the scattering of fast electrons by hydrogen and helium atoms P1270
- Mathur K.C., Tripathi A.N. and Joshi S.K.: Elastic scattering of electrons by lithium atoms using modified Glauber approximation L39
- Matić M. and Čobić B.: Electron loss by C⁻ and O⁻ ions in gaseous targets P111
- Matić M. with Vujović M., Čobić B. and Gordeev Yu. S.: Analysis of metastable state population in fast ion beams L18
- Mayers D.F. with Desclaux J.P. and O'Brien F.: Relativistic atomic wave functions P631
- Mazeau, J. with Reinhardt J., Hall R.I. and Joyez G.: Resonance phenomena in the low energy electron impact excitation of helium by trapped electron method L61
- Metchnik V.I. with Story I.C. and Parsons R.W.: The measurements of the widths and pressure-induced shifts of microwave spectral lines P593
- Middleton C.R., Payne M.F. and Riviere A.C.: Dissociation of H₃⁺ ions at 410, 510 and 550 keV in H₂ gas L88
- Middtdal J. with Hølsien E.: Tests of the multiconfiguration energy-bound method for Feshbach-type autoionization states of two-electron atoms: II. Application to He states between higher thresholds P32
- Middtdal J. with Hølsien E.: Variation nonrelativistic calculations for the (2pnp)¹⁻³P states of two-electron atomic systems P1243
- Mitchell D.J., Ninham B.W. and Richmond P.: Exact interaction energy between two anisotropic polarizable dipoles L81
- Mohan H. with Singh J.: Thermally excited emission spectrum of barium monofluoride P1395
- Moiseiwitsch B.L. with Heaton M.: Virial Theorem for variational functions in collision theory P332
- Moiseiwitsch B.L. with Holt A.R. and Hunt, J.: Forward elastic scattering of electrons by helium L41
- Moiseiwitsch B.L. with Holt A.R. and Hunt, J.: Application of a simplified second Born approximation to the scattering of electrons and protons by helium atoms P1318
- Morris J. with Learner R.C.M.: Autoionizing even levels in the mercury arc spectrum P1236
- Morrow R. with Brennan H.M.: Proton-hydrogen atom momentum transfer cross section at ~5 eV L53
- Moser C. with Bagus P.S. and Hibbert A.: Multiconfiguration Hartree-Fock calculations of the 2p³ and 2p⁴ isoelectronic series P1611
- Moser C.M. with Desclaux J.P. and Verhaegen G.: Relativistic energies of excited states of atoms and ions of the second period P296
- Mullick K. with Barua A.K. and Saha S.: On the asymmetry in the angular distribution of the fragments produced from the collisions induced dissociation of HD⁺ ion P1450
- Musso G.F. and Magnasco V.: Evaluation of four-centre molecular integrals P1415
- Najjar H.Y. with Birks J.B. and Lumb M.D.: Energy transfer in organic systems: XI. Temperature dependence of singlet excitation transfer and quenching in toluene solutions P1516
- Nakshbandi M.M. with Mahdavi M.R. and Hasted J.B.: Electron-ion recombination measurements in the flowing afterglow P1726
- Naon M. and Cornille M.: Correlation effects in x-ray and electron intensities for the neon atom P1210
- Naon M., Cornille M. and Roux M.: Compton profiles for the first and second row atoms 1593
- Nédélec O. with Baltayan P.: Polarization of molecular lines by electron impact. United atom and Born approximation P1332
- Neupert W. with Swartz M., Kastner S. and Rothe E.: Soft x-ray spectra of Cr, Mn, Fe, Co, Ni, Cu; classifications in NeI, FI, OI, NI, and CI isoelectronic sequences P1747
- Neveu B. with Girardeau R., Kynstautas E.J., Beauchemin G., et al., and Drouin R.: Equilibrium charge distribution of C, N, O, and Ne in carbon foil P1743
- Newell W.R., Ross K.J. and Wickes J.B.P.: Generalized oscillator strengths in the electron impact spectra of cadmium vapour P684
- Newell W.R. with Wicks J.B.P. and Ross K.J.: Autoionization spectrum of cadmium vapour by electron impact L26

- Newman D.J. with Copland G.M. and Taylor C.D.: Configuration interaction in rare earth ions: II. Magnetic interactions P1388
- Newman D.J. with Copland G.M. and Taylor C.D.: Configuration interaction in rare earth ions: III. Tree parameters for Pr^{2+} and Pr^{3+} P1605
- Newman D.J. and Taylor C.D.: Configuration interaction in rare-earth ions I. Three particle correlations in Pr^{2+} P241
- Nicholls R.W. with Hasson V.: Absolute absorption oscillator strength measurements of the ($a^1\Pi-x^1\Sigma$) Cameron band system of CO P681
- Nicholls R.W. with Hasson V.: Absolute spectral absorption measurements of the $\text{NO}-\beta(a^1\Pi-x^1\Pi)$ band system of nitric oxide P1769
- Nicholls R.W. with Hasson V.: Absolute spectral absorption measurements on molecular oxygen from 2640-1920 Å: I. Herzberg I ($\lambda^1\Sigma^+-x^1\Sigma^+$) bands (2640-2430 Å) P1778
- Nicholls R.W. with Hasson V.: Absolute spectral absorption measurements on molecular oxygen from 2640-1920 Å: II. Continuum measurements 2430-1920 Å P1789
- Nicholls R.W. with McCallum J.C.: Franck-Condon factors and related quantities for the Fox-Duffendack-Barker ($\lambda^1\Pi_u-x^1\Pi_g$) and ultraviolet doublet ($\lambda^1\Sigma_u-x^1\Pi_g$) band systems of Co_2^+ P1096
- Nigam A.N. with Garg K.B. and Kapoor, Q.S.: Satellite $L\beta_3^1$ in x-ray spectra of rare earths P739
- Nikolaev V.S. with Teplova Ya. and Dmitriev I.S.: On electron loss and capture cross sections for multiply charged ions in solid matter L70
- Ninham B.W. with Mitchell D.J. and Richmond P.: Exact interaction energy between two anisotropic polarizable dipoles L81
- Norcliffe A.: Correspondence identities V. The zero-energy Coulomb problem P143
- Norcross D.W.: Photoionization of the He metastable states P652
- Norcross D.W.: Low energy elastic scattering of electrons by Li and Na P1458
- O'Brien F. with Desclaux J.P. and Mayers D.F.: Relativistic atomic wave functions P631
- Opal C.B. with Peterson W.K. and Beatty E.C.: Energy distributions of electrons ejected in ionizing collisions of electrons with helium P1020
- Orient O.J.: The mobility of mass-identified protons in helium gas P1257
- Pacher P.: General form of the second centrifugal correction of rotational terms of diatomic molecules P887
- Pacher P. with Kovács I.: General theory of the rotational structure of $^4\Sigma$ states of diatomic molecules: II P1633
- Paget T.M. with Fawcett B.C. and Gabriel A.H.: New observations of the spectra of argon X to XV and of isoelectronic emission lines in silicon VII to X, phosphorus X, sulphur IX to XII and chlorine X to XIV P986
- Pandey P.C., Kirty K.K. and Srivastava S.L.: Collision broadening of the OCS J1-2 line by non-polar perturbers P786
- Parcell L.A. and Stauffer A.D.: Evaluation of matrix elements by a method of steepest descents P814
- Parsons R.W. with Story I.C. and Metchnik V.I.: The measurements of the widths and pressure-induced shifts of microwave spectral lines P593
- Patel M.M. with Abraham K.C.: Fine structure analysis of the C_2 system ($\lambda 2600-\lambda 2700$ Å) of the SbF molecule P1398
- Payne M.F. with Middleton C.R. and Riviere A.C.: Dissociation of H_2^+ ions at 410, 510 and 550 keV in H_2 gas L88
- Peach G.: Ionization of atoms and positive ions by electron and proton impact P1670
- Peacock N.J. with Burgess D.D.: Reduced limits on the magnitude of possible plasma polarization shifts L94
- Pearl B. and Dolder K.T.: Collisions between electrons and H_2^+ ions: I. Measurements of cross section for proton production P1496
- Pearl B., Walton D.S. and Dolder K.T.: The formation of H^+ from H^- ions by electron impact P88
- Pearl B. with Walton D.S. and Dolder K.T.: A measurement of cross sections for detachment from H^- by a method employing inclined ion electron beams P1343
- Pedersen L. with Barrow R.F.: Rotational analysis of the system $a^1\Pi \rightarrow \Sigma^+$ of gaseous ScF L11

- Percival I.C. and Richards D: Excitation of highly excited hydrogenic ions and atoms by charged particles II P918
- Percival I.C. and Richards D: Excitation of highly excited hydrogenic ions and atoms by charged particles III P932
- Pert G.J: The thermodynamics of multiphoton processes L72
- Peterkop R: WKB approximation and threshold law for electron-atom ionization P513
- Peterkop R. and Rabik L: Effect of inaccuracy of atomic wavefunctions in variational calculations of scattering length P1440
- Peterson W.K, Opal C.B. and Beatty E.C: Energy distributions of electron ejected in ionizing collisions of electrons with helium P1020
- Phillips N.J. with Coaton J.R: The influence of convection and thermal diffusion on halogen separation in vertical burning linear tungsten-halogen lamps P248
- Piacentini R.D. with McCarroll R: Rotational coupling effects on the differential elastic and inelastic sections in He⁺-He collisions P1026
- Pillow M.E. with Chalmers A.G: The influence of N₂ and CO impurities on the spectral emission from a mercury-argon discharge P1587
- Platias M. with Konjevic N. and Puric J: Electron impact broadening of ionized chlorine lines P1541
- Poulizac M.C. with Druetta M. and Ceyzeriat P: Radiative mean lives of oxygen V states P1070
- Powell J.M. with Dutton I: The influence of Penning ionization on the experimental determination of ionization coefficients in helium at low values of E/N P1506
- Preist T.W: The density of states in the static screened Coulomb potential P1129
- Puric J. with Konjevic N. and Platias M: Electron impact broadening of ionized chlorine lines P1541
- Rabik L. with Peterkop R: Effect of inaccuracy of atomic wavefunctions in variational calculations of scattering length P1440
- Rai S. with Deodhar G.B: Decisive criterion for determination of spin doublets in x-ray diagram lines P976
- Rai S. with Deodhar G.B: Quasi-stationary states and some L satellites of metallic silver P1119
- Rai D.K. with Dube P.S: Electronic transition moment variation in a $^{111}\text{In}-^{125}\text{Te}$ system of SnO molecule and determination of the effective vibrational temperature P579
- Rai D.K. with Triparthi D.N: Importance of the kinetic energy expression for the bound electron in the binary collision theory of ionization P365
- Rakshit A.B: Relative merits of the preaveraging and equal probability approximations for dipole-dipole interaction in polar gases P1267
- Ramakrishna Rao T.V. with Lakshman S.V.J: RKRV curves, r -centroids and Franck-Condon factors for certain bands of AsO and AsO⁺ molecules P269
- Rama Mohan C.V and Sobhanadri J: Temperature dependence of ^{107}Ag NQR frequency in HgCl₂ P1393
- Rao B.S: Vibration-rotation bands strengths and dipole moment function of the H¹⁹⁹Br molecule P791
- Rao C.N. with Singh K.P. and Singru R.M: Positron lifetime studies in organic media P261
- Rao, P.T. with Reddy B.R.K. and Reddy Y.P: The visible emission spectrum of strontium moniodide P574
- Read F.H. with Andrick D: Angular distribution for the excitation of vibronic states by resonant electron molecule reactions P389
- Read F.H. and Andrick D: Angular distributions for the excitation of rotational states by resonant electron molecule reactions P911
- Read F.H. with Comer J: Potential curves and symmetries of some resonant states of H₂⁺ P368
- Read F.H. with Comer J: Electron impact studies of a resonant state of N₂⁺ P1055
- Read F.H. with Comer J: Resonance scattering of electrons from CO P1678
- Read F.H. with Imhof R.E: A new electron-photon coincidence method for the measurements of lifetimes in atoms and molecules P450
- Read F.H. with Imhof R.E: Measured lifetimes of the $c^1\Pi_u$ state of N₂ and the $a^3\Sigma_u^+$ state of H₂ P1063
- Rebbeck M.M. with Lewis E.L. and Vaughan J.M: Resonance broadening in the spectra of potassium P741

- Rebbeck M.M. and Vaughan J.M.: Unidentified diffuse bands in the spectrum of potassium P258
- Reddy B.R.K., Reddy Y.P. and Rao P.T.: The visible emission spectrum of strontium moniodide P574
- Reddy Y.P. with Reddy B.R.K. and Rao P.T.: The visible emission spectrum of strontium moniodide P574
- Regemorter H. Van. with Feautrier N. and Vo Ky Lan: The method of polarized orbitals: II. The close coupling method using a polarized orbital expansion P670
- Reinhardt J., Hall R.I., Joyez G. and Mazeau J.: Resonance phenomena in the low energy electron impact excitation of helium by trapped electron method L61
- Reinhardt W.P. with Rescigno T.N.: Extraction of accurate scattering information from apparently divergent Fredholm series: The centrifugal barrier P1279
- Rescigno T.N. and Reinhardt W.P.: Extraction of accurate scattering information from apparently divergent Fredholm series: the centrifugal barrier P1279
- Reynolds R.M. with Gilbody H.B., Browning R. and Riddell G.I.: Collisional destruction of fast metastable hydrogen atoms P94
- Richards A.G. with Burgess D.D. and Mahon R.: A new technique for the optical generation of electron plasma waves L76
- Richards D. with McDowell M.R.C.: The on-shell coulomb T matrix L105
- Richards D. with Percival I.C.: Excitation of highly excited hydrogenic ions and atoms by charged particles II P918
- Richards D. with Percival I.C.: Excitation of highly excited hydrogenic ions and atoms by charged particles III P932
- Richmond P. with Mitchell D.J. and Ninham B.W.: Exact interaction energy between two anisotropic polarizable dipoles L81
- Riddell G.I. with Gilbody H.B., Browning R. and Reynolds R.M.: Collisional destruction of fast metastable hydrogen atoms P94
- Ritchie B.: Linear perturbation to molecular vibrational states due to long-range polarization in highly excited and scattering electronic states: reduction factors for the Franck-Condon overlap P1076
- Riviere A.C. with Middleton C.R. and Payne M.F.: Dissociation of H_2^+ ions at 410, 510 and 550 keV in H_2 gas L88
- Robb W.D. with Burke P.G. and Hibbert A.: Electron scattering by complex atoms P153
- Roegen I.: The theory of the Stark effect in multiplet states of diatomic polar molecules P168
- Ross K.J. with Newell W.R. and Wickes J.B.P.: Generalized oscillator strengths in the electron impact spectra of cadmium vapour P684
- Ross K.J. with Wickes J.B.P. and Newell W.R.: Autoionization spectrum of cadmium vapour by electron impact L26
- Rost K.A. with Hertel I.V.: Application of the second Born approximation to the $3s-4s$ excitation of sodium by electron impact P690
- Rostas F. and Lemaire J.L.: Low pressure measurements of the broadening and shift of the caesium 4555 Å and 4593 Å lines by helium and argon P555
- Rothe E. with Swartz M., Kastner S. and Neupert W.: Soft x-ray spectra of Cr, Mn, Fe, Co, Ni, Cu; classification in NeI, FI, OI, NI, and CI isoelectronic sequences P1747
- Roux M. with Naon M. and Cornille M.: Compton profiles for the first and second row atoms P1593
- Roy N.R. with Venkatesh H.G.: Formalism of angular momentum for an assembly of two-level systems P408
- Rundel R.D. with Aitken K.L. and Harrison M.F.A.: Measurements of the cross section for electron impact ionization of multi-electron ions: II. N^{2+} to N^{3+} and C^+ to C^{2+} P1189
- Saha S. with Barua A.K. and Mullick K.: On the asymmetry in the angular distribution of the fragments produced from the collisions induced dissociation of HD^+ ion P1449
- Salin A.: Charge-exchange between protons and atomic hydrogen: Comparison between theory and experiment L125
- Salin A. with Gaussorgues C.: Differential and total cross sections for excitation of the $n = 2$ level of hydrogen by proton impact P503
- Salin A. with Janev R.K.: Charge-exchange in hydrogen atom collisions L127

- Sandle W.J. with Gunn H.I.: A method for the direction determination of the decay rate γ_0 for the population of an excited atomic state L1
- Sandle W.J. and Williams O.M.: A classical approach to coherence narrowing during multiple scattering of resonance radiation (linear polarization case) P531
- Santaram C, Vaidyan V.K. and Winans J.G.: The visible emission spectra of ZnTi_2 , CdTi_2 , ZnTi , and CdTi molecules P133
- Sassi M. with Sayer B, Wang R. and Jeannot J.C.: Absorption measurements of quadrupole transition probabilities $6S\text{-}nD$ in caesium vapour L20
- Saun K.A. with Benesch W.M.: The $w^2\Delta_u$ state of molecular nitrogen P732
- Saxena, K.M.S.: Self-consistent field with exchange for U^{6+} P433
- Sayer B, Wang R, Jeannot J.C. and Sassi M.: Absorption measurements of quadrupole transitions probabilities $6S\text{-}nD$ in caesium vapour L20
- Schulz M.: Evaluation of a Coulomb integrals for particle scattering P1476
- Schwartz S.B. with Bely O. and Val J.L.: Autoionization structure in the ionization of Ba^+ by electron impact P1482
- Shelton W.N, Balajua K.L. and Watson C.E.: Elastic exchange scattering of electrons on the hydrogen atom in the distorted wave approximation P71
- Sheorey V.B.: Quantum defects for He I and Li II L44
- Sheorey V.B, Gerjuoy E. and Thomas B.K.: Comparisons of the Glauber and Vainshtein approximations for inelastic electron-hydrogen scattering L57
- Shobha P. with Khare S.P.: Differential cross sections for the elastic scattering of electrons by helium atoms P208
- Sidis V. and Lefebvre-Brion H.: A 'quasi-adiabatic' representation for inelastic collisions. Application to the scattering of He^+ by Ne P1040
- Sil N.C. with Banerji G. and Banerjee S.N.: Binding energy of helium atom by Faddeev formalism L5
- Sil N.C. with Ghosh A.S.: Inelastic proton-hydrogen scattering by Glauber approximation P836
- Simpson F.R, Browning R. and Gilbody H.B.: An experimental study of the decay of the He^- ion P1060
- Sinfaillam A.L. and Thompson D.G.: The Pople-Schofield approximation in the calculation of polarizabilities and polarization potentials P461
- Singh J. and Mohan H.: Thermally excited emission spectrum of barium monofluoride P1395
- Singh K.P, Singru R.M. and Rao C.N.: Positron lifetime studies in organic media P261
- Singh M.: A new electronic state of MgO P565
- Singh S. with Singh Y.: Preaveraged potential and the third virial coefficient of polar gases P776
- Singh Y. and Singh S.: Preaveraged potential and the third virial coefficient of polar gases P776
- Singru R.M. with Singh K.P. and Rao C.N.: Positron lifetime studies in organic media P261
- Sitz P.: Comment on 'Lower bounds to energy levels of two-electron atoms' L107
- Smith A.C.H. with Dunning F.B.: Secondary electron ejection from metal surfaces by metastable atoms: II. Measurements of secondary emission coefficients using a gas cell method P1696
- Smith A.C.H. with Dunning F.B. and Stebbings R.F.: Secondary electron ejection from metal surfaces by metastable atoms: I. Measurements of secondary emission coefficients using a crossed beam method P1683
- Smith P.D. with Bradley D.J. and Gale G.M.: Stimulated Stokes and anti-Stokes electronic Raman scattering by selectively excited potassium and rubidium atoms P1349
- Smith R.E. and Gaydon A.G.: The spectrum of titanium hydride, TiH and TlD P797
- Smith W.L.: Moment analyses of intensity distribution in molecular electronic spectra P584
- Snyder R.: A formula for relativistic atomic energies P1150
- Sobhanadri J. with Rama Mohan C.V.: Temperature dependence of ^{55}Cl NQR frequency in HgCl_2 P1393
- Sprevak D. with Bates D.R.: Translation factor in basis functions used in perturbed stationary state approximation and capture in $\text{H}^+-\text{H}(1s)$ collisions L47
- Sprevak D. with Bates D.R. and Hayes P.B.: Kinetic energy of ion pairs in three-body ionic recombination P962

- Srivastava S.L. with Pandey P.C. and Kirty K.K.: Collision broadening of the OCS J1-2 line by non-polar perturbers P786
- Stacey D.N.: Isotope shifts in electronic and muonic atoms, with application to neodymium P969
- Stauffer J.A. with Cohen M, McEachran R.P. and Cameron S: Lower bounds to energy levels of two-electron atoms P1109
- Stauffer A.D. with Parcell L.A.: Evaluation of matrix elements by a method of steepest descents P814
- Stebbins R.F. with Dunning F.B. and Smith A.C.H.: Secondary electron ejection from metal surfaces by metastable atoms: I. Measurements of secondary emission coefficients using a crossed beam method P1683
- Story I.C., Metchnik V.I. and Parsons R.W.: The measurement of the widths and pressure-induced shifts of microwave spectral lines P593
- Swartz M., Kastner S., Rothe E. and Neupert W.: Soft x-ray spectra of Cr, Mn, Fe, Co, Ni, Cu; classifications in Ne I, Fl, Ol, Ni, and Cl isoelectronic sequences P1747
- Tancic A.R. with Janev R.K.: Electron detachment in H-H⁻ and O-O⁻ collisions P219
- Tankhiwale A.V., Khare P.L. and Mande C.: Application of the Z effective values of hydrogenic wavefunctions in the calculation of the K-LL Auger energies P1250
- Taylor C.D. with Copland G.M. and Newman D.J.: Configuration interaction in rare earth ions: II. Magnetic interactions P1388
- Taylor C.D. with Copland G.M. and Newman D.J.: Configuration interaction in rare earth ions: III. Tree parameters for Pr³⁺ and Pr³⁺ P1605
- Taylor C.D. with Newman D.J.: Configuration interaction in rare-earth ions I. Three particle correlation in Pr³⁺ P241
- Teplava Ya.A., Dmitriev I.S. and Nikolaev V.S.: On electron loss and capture cross sections for multiply charged ions in solid matter L70
- Thomas B.K. with Sheorey V.B. and Gerjuoy E.: Comparisons of the Glauber and Vainshtein approximations for inelastic electron-hydrogen scattering L57
- Thompson D.G. with Sinfailam A.L.: The Pople-Schofield approximation in the calculation of polarizabilities and polarization potentials P461
- Thompson D.H.: The elastic scattering of electrons by nitrogen, neon, phosphorus and argon atoms P468
- Tondello G. and McWhirter R.W.P.: Measurements of excitation rate coefficients for singlet and triplet transitions of neon VII P715
- Tripathi A.N. with Mathur K.C. and Joshi S.K.: Elastic scattering of electrons by lithium atoms using modified Glauber approximation L39
- Tripathi D.N. and Rai D.K.: Importance of the kinetic energy expression for the bound electron in the binary collision theory of ionization P365
- Trivedi P.C.: Wave functions for H₃⁺ P420
- Urata N. and Watanabe T.: Validity of Pradhan's impulse approximation for high energy charge transfer processes L121
- Vaidyan V.K. with Santaram C. and Winans J.G.: The visible emission spectra of ZnTl₂, CdTl₂, ZnTl, and CdTl molecules P133
- Val J.L. with Bely O. and Schwartz S.B.: Autoionization structure in the ionization of Ba⁺ by electron impact P1482
- Vaughan J.M. with Lewis E.L. and Rebbeck M.M.: Resonance broadening in the spectra of potassium P741
- Vaughan J.M. with Rebbeck M.M.: Unidentified diffuse bands in the spectrum of potassium P258
- Venkatesh H.G. and Roy N.R.: Formalism of angular momentum for an assembly of two-level systems P408
- Verhaegen G. with Desclaux J.P. and Moser C.M.: Relativistic energies of excited states of atoms and ions of the second period P296
- Veseth L.: Spin-rotation interaction in diatomic molecules P20
- Vo Ky Lan: The method of polarized orbitals I: Elastic scattering of slow electrons by alkali atoms P658
- Vo Ky Lan. with Feautrier N. and Regemorter H.Van: The method of polarized orbitals II. The close coupling method using a polarized orbital expansion P670

- Vujišić B. with Kovács I: Centrifugal distortion of the spin-orbit and spin-rotation interaction for doublet terms P1123
- Vujović M, Matić M, Čobić B. and Gordeev Yu.S: Analysis of metastable state population in fast ion beams L18
- Wakeham W.A: Dimers and the thermal diffusion factor at low temperatures P1564
- Wakeham W.A. with Grew K.E: A redetermination of the thermal diffusion factor for some inert gas mixtures: I P1548
- Walker T.E.H: Relativistic contributions to the energies of atoms P399
- Wallace R. with Corrigal B: Coupled state calculations of proton-hydrogen atom scattering with nonlinear trajectories P1013
- Walters H.R.J: Integral equation method for the determination of the scattering amplitude P437
- Walton D.S. with Peart B. and Dolder K.T: The formation of H^+ from H^- ions by electron impact P88
- Walton D.S, Peart B. and Dolder K.T: A measurement of cross sections for detachment from H^- by a method employing inclined ion electron beams P1343
- Wang R. with Sayer B, Jeannot J.C. and Sassi M: Absorption measurements of quadrupole transition probabilities $6S-nD$ caesium vapour L20
- Wanless D: Electron-ion recombination in argon P522
- Watanabe T. with Urata N: Validity of Pradhan's impulse approximation for high energy charge transfer processes L121
- Watson C.E. with Shelton W. and Balajua K.L: Elastic exchange scattering of electrons on the hydrogen atom in the distorted wave approximation P71
- Wendin G: Collective effects in atomic photoabsorption spectra I P1080
- Wickes J.B.P. with Newell W.R. and Ross K.J: Generalized oscillator strengths in the electron impact spectra of cadmium vapour P684
- Wickes, J.B.P, Ross K.J. and Newell W.R: Autoionization spectrum of cadmium vapour by electron impact L26
- Williams O.M. with Sandle W.J: A classical approach to coherence narrowing during multiple scattering of resonance radiation (linear polarization case) P531
- Wilson R.G: A perturbation treatment of the unrestricted Hartree-Fock equations for the ground states of 3- to 10-electron atoms P228
- Wilson R.G: A perturbation treatment of the Hartree-Fock equations for the ground states of 3- to 10-electron atoms P311
- Wilson R.G. and Eliezer I: The third-order Hartree-Fock energy for the $1s2s^1\ ^3S$ states of helium-like ions P1255
- Winans J.G. with Santaram C. and Waidyan V.K: The visible emission spectra of $ZnTi_2$, $CdTi_2$, $ZnTi$, and $CdTi$ molecules P133
- Wittkower A.B. and Betz H.D: Charge changing cross sections for heavy ions in complex molecules: the failure of an 'additive' rule P1173
- Wykes J: A general optical detector of the polarization of low energy electrons L91
- Yousaf M.M. with Haated J.B. and Iqbal S.M: Curve-crossing in single electron capture collisions P343